frequent. Disaccate grains referable to *Podocarpidites* are very rare. *Classopollis* grains which have been related[1] with genera like *Cheirolepis*, *Brachyphyllum* and *Pagiophyllum* are dominantly present, constituting about 80 per cent of the polospores recovered.

The microfloral assemblage is indicative of Lower–Middle Jurassic age and suggests that the deposition occurred in a coastal or deltaic region under dry climatic conditions.

A striking similarity has been observed with the flora of the Jurassics of Western Australia[2], western Siberia[3] and Madhya Pradesh, India[4] (Jabalpur Series). This microflora has also striking similarity with the Mesozoic of South Africa[5]; some of the forms are also comparable with Jurassic of Andigama, Ceylon[6], and Salt Range, West Pakistan[7].

Mchedlishvili and Samoilovich[8] have noted the similarity in the Mesozoic and Cenozoic microflora of western Siberia and Australia. They have suggested some intermediate tropical region whence the dipolar migration of elements of floras might have taken place. The striking similarity of the microflora of Lathi Formation with that of Western Australia and Siberia supports such a possibility.

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ENTOMOLOGY

Steroid Biosynthesis in the Silkworm

It has already been established in the silkworm (*Bombyx mori* L.) that sterol is one of the biologically vital active principles in the 'brain' hormone[1] and an important nutrient in artificial diet[2].

Generally, sterol is synthesized from the acetate in the mammal, even though some insects, such as *Dermestes vulpinus*[3] and *Musca domestica*[4], cannot synthesize sterol from acetate labelled with carbon-14. On the contrary, Casida *et al.*[5] reported that *Periplaneta americana* is able to incorporate about 0·08 per cent of administered acetate into digitonide.

It is not yet known, however, whether in *Bombyx mori* sterol is biosynthesized from the acetate of the same precursor as in mammals, or whether the sterol biosynthesis has an intimate relation to a stage in post-embryonic development. Therefore, we have investigated this problem by injection of 2-^{14}C-acetate into silkworm larvæ, pupæ, and 'Dauer' pupæ[1].

The silkworms of the F_1 hybrid between two races, *J.* 122 and *C.* 115, at eight stages were used (Table 1).

The injection of 2-^{14}C-sodium acetate into larvæ was carried out under anæsthetization with ether and the procedure of both pupæ and 'Dauer' pupæ was facilitated by immobilization at 5° C. After 20 h at 25° C following the injection of dosages presented in Table 1, animals injected in each stage were homogenized in methanol respectively and centrifuged, and this procedure was repeated three times. Each residue was extracted with ether. Both extracts, methanol and ether, were mixed and saponified. Ether was evaporated from eight unsaponifiable fractions, after each fraction was extracted with ether, respectively.

Table 1. Injection of 2-^{14}C-Acetate into the Silkworm

Stage of silkworm	No. of specimens	Total live weight (g)	Dose* (ml./silkworm)	C.p.m. of total dose (*A*)†
IV instar (3 days)	25	20·0	0·010	9·78 × 10^5
V instar (3 days)	13	21·8	0·025	12·71 × 10^5
V instar (8 days) (mature larva)	8	17·6	0·025	7·82 × 10^5
Pre-pupa	12	12·0	0·020	9·41 × 10^5
Pupa (0 h)	12	15·5	0·020	9·41 × 10^5
Pupa (6 days)	16	24·0	0·025	15·64 × 10^5
Brainless pupa (0 h, immediately after pupation and extirpation of brain)	18	23·2	0·020	14·12 × 10^5
'Dauer' pupa (30 days)	12	17·3	0·020	9·41 × 10^5

* 2 μc of 2-^{14}C-sodium acetate in 0·025 ml. of solution.
† See Table 2.

The unsaponifiable fractions were dissolved in 90 per cent alcohol, and 1 per cent digitonin in 90 per cent alcohol was added to those fractions. At 24 h after the foregoing treatments, digitonide was filtered from each fraction and washed three times with absolute ether respectively. The resulting precipitates as digitonide were dried, weighed, and counted by Nuclear-Chicago model *D*47 gas-flow counter (Table 2). The radioactivity of digitonide scarcely changed with the recrystallization. According to Saito *et al.*[6], moreover, digitonide obtained from non-injected larvæ and pupæ consists of three sterols without other substances. From this evidence, it seems that a major component of radioactive digitonide mentioned here is sterol.

Table 2. Incorporation of 2-^{14}C-Acetate into Digitonide in the Silkworm

Stage of silkworm	Weight of digitonide (*B*) (mg)	Total activity (*C*) (c.p.m.)	C.p.m. per mg (*C*/*B*)	Percentage of incorporation (*C*/*A*)*
IV instar (3 days)	39·1	307	7·85	0·03
V instar (3 days)	38·7	160	4·13	0·01
V instar (8 days) (mature larva)	41·3	70	1·69	0·01
Pre-pupa	47·6	1,079	22·67	0·11
Pupa (0 h)	57·3	2,926	51·06	0·31
Pupa (6 days)	20·6	3,232	156·89	0·21
Brainless pupa (0 h, immediately after pupation and extirpation of brain)	100·9	2,023	20·05	0·14
Dauer' pupa (30 days)	105·3	180	1·71	0·02

* *A* is presented in Table 1.

As shown in Table 2, incorporation of ^{14}C-acetate into digitonide is very weak, if it is present at the larval stage, while the incorporation of that is conspicuous in both pre-pupal and pupal stages. Therefore, we are inclined to believe that ^{14}C-acetate is a precursor of sterol in the silkworm pupa as in mammals. The 'Dauer' pupa, 30 days old, however, cannot synthesize sterol from ^{14}C-acetate, or, if the system is present, it is very weak. This fact may suggest that the brain takes part in the sterol metabolism in the silkworm.

In view of this, we are investigating sterol biosynthesis from various precursors and the sterol metabolism in the silkworm.

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