

**265. *The Chemistry of Insects. Part III. The Wax of Psylla buxi.***

By B. K. BLOUNT.

THE insect *Psylla buxi* Réaum. flourishes during summer on the shoots of box bushes. It secretes rather characteristic curved filaments of waxy material, the purpose of which is not obvious; they are very light, and are soon dispersed by wind and weather, but it has been possible to collect sufficient (0.15 g.) of the wax for the determination of its nature.

On hydrolysis the wax gave equal amounts of acid and alcohol. The former melted at 92.7°,\* and gave an ethyl ester of m. p. 68.8°. From the latter m. p., by making use of the data of Piper, Chibnall, and Williams (*Biochem. J.*, 1934, **28**, 2175), it is possible to deduce a mean chain length for the acid of about 29.9. Such a mean chain length would be provided by a mixture of 95% of the C<sub>30</sub> acid with 5% of the C<sub>28</sub> compound; and reference to the mixed m. p. curves of those authors shows that such a mixture melts at 93.0°.

The alcoholic half melted at 86.2°, and gave an acetate of m. p. 68.7°. In this case also the mean chain length appears to be about 29.9, and the mixed m. p. curve shows that a mixture of 95% of the C<sub>30</sub> alcohol with 5% of the C<sub>28</sub> compound melts at 86.2°. Further confirmation was obtained by oxidising the alcohol to the corresponding acid, which melted at 92.5°. This also demonstrates clearly that the wax contained no appreciable quantity of paraffin.

The wax excreted by *Psylla buxi* Réaum., therefore, consists of an ester of equivalent amounts of the C<sub>30</sub> acid and alcohol, containing each about 5% of the C<sub>28</sub> compound. It

\* The temperatures given are those at which the substances became completely molten. The temperature range between softening and clearing was never more than 0.5°, and generally less.

differs from most insect waxes in being almost a pure substance, and in containing very little or no paraffin.

*Isolation of the Wax.*—A mixture of wax and insects was shaken off the box shoots into a basin. The wax was isolated by boiling the mixture with chloroform, filtering hot, evaporating to a small volume, and adding alcohol. The resulting brownish wax was crystallised twice from chloroform–alcohol, charcoal being used in the first crystallisation, and then formed colourless scales, m. p. 89·6—90·1° (Found: C, 82·5; H, 13·9. Calc. for  $C_{60}H_{120}O_2$ : C, 82·6; H, 13·9%).

*Hydrolysis of the Wax.*—The wax (100 mg.) was hydrolysed essentially by the method previously described (Part I, J., 1935, 391), but with two modifications. Benzene was added to the hydrolysis mixture on account of the sparing solubility both of the wax and of the alcohol produced, and the second hydrolysis (with sodium ethoxide) was omitted. The results appear to justify the omission.

The acid (45 mg.) crystallised from acetic acid in colourless plates. The alcohol (45 mg.) was readily freed from traces of calcium soaps by recrystallisation from benzene (charcoal), and formed colourless plates. Oxidation of the alcohol (18 mg.) in hot acetic acid solution with the theoretical amount of chromium trioxide gave an acid which, after purification through the calcium salt, melted at 92·5°.

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THE DYSON PERRINS LABORATORY, OXFORD.

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