amine oxidase (rabbit liver) and by diamine oxidase (pig kidney) has been studied.

2. Dodecylamine is oxidized by amine oxidase, whereas octadecylamine is not oxidized.

3. Of the straight-chain diamines, hexamethylene diamine and octamethylene diamine are substrates of diamine oxidase; the three diamines with 14, 16 and 18 carbon atoms are not oxidized by the enzyme.

4. The diamines with 14, 16 and 18 carbon atoms are substrates of amine oxidase.

5. The specificity of substrates of the two enzymes is discussed in connexion with these results.

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The Colouring Matters of Galls. 2

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Whereas it is comparatively easy to collect galls produced by insects, the collecting of galls formed by fungi offers greater difficulties. Furthermore, these galls have not been so extensively studied as insect-galls (Guttenberg, 1905). Thanks to Dr von Wehner, the nephew and assistant of the late Dr von Guttenberg, we were able to obtain reasonable quantities of the six galls investigated by his uncle, which Dr von Wehner collected for us in the vicinity of Graz. Galls of *Ustilago maydis* Guttenberg, on maize collected by one of us at Tifton, Georgia, U.S.A., were found to contain the same pigment as the Austrian galls.

EXPERIMENTAL

The pigments were prepared, identified and investigated as described by Nierenstein & Swanton (1944). They proved known colouring matters described by Nierenstein & Swanton, whose preparations we used for mixed melting-points. The yields in all cases were poor, the maximum obtained being 0.27 %.

Analytical and descriptive data

Melampsorin. Yellow needles, m.p. and mixed m.p. 233–237° produced by *Exoascus amentorum* H. Schneider on the fruits of *Alnus incana* Web. (Found: C, 50.7; H, 5.2; purpurogallin, 40.5; glucose, 63.7 %; mol. wt. 539, 551. Calc. for $C_{23}H_{28}O_{15}$: C, 50.7; H, 5.2; purpurogallin, 40.4; glucose, 63.2 %; mol. wt. 544.)

Raetelin. Red needles, m.p. and mixed m.p.

242–244°, isolated from the galls produced by *Albugo candida* Pers. on the leaves of *Capsella bursa pastoris* L., by *Exobasidium rhododendri* Cram. on the leaves of *Rhododendron hirsutum* L. and *R. ferrugineum* L. (Found: C, 50.6, 50.7, 50.4; H, 5.3, 5.3, 5.4; purpurogallin, 40.5, 40.4, 40.5; glucose, 63.0, 63.3, 63.1 %; mol. wt. 555, 573; 541, 549; 551, 587. Calc. for $C_{23}H_{28}O_{15}$: C, 50.7; H, 5.2; purpurogallin, 40.4; glucose, 63.2 %; mol. wt. 544.)

Xestophanesin. Dark red needles, m.p. and mixed m.p. 265–266°, produced by *Puccinia adoxxae* Haberl. on the leaves, twigs and buds of *Adoxa moschatellina* L. (Found: C, 50.8; H, 5.5; purpurogallin, 40.4; glucose, 63.1 %; mol. wt. 551, 562. Calc. for $C_{23}H_{28}O_{15}$: C, 50.7; H, 5.2; purpurogallin, 40.4; glucose, 63.2 %; mol. wt. 544.)

Pontanin. Yellow needles, m.p. and mixed m.p. 283–287° produced by *Ustilago maydis* Guttenberg on the leaves of *Zea mays* L. (Found: C, 50.6, 50.8; H, 5.3, 5.2; purpurogallin, 40.5, 40.4; glucose, 63.0, 63.2 %; mol. wt. 548, 554; 547, 562. Calc. for $C_{23}H_{28}O_{15}$: C, 50.7; H, 5.2; purpurogallin, 40.4; glucose, 63.2 %; mol. wt. 544.)

In conclusion we draw attention to the use of these colouring matters as low-range indicators (Nierenstein, 1945).

SUMMARY

The isolation and characterization of colouring matters from various galls produced by fungi is described.

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