(CCl_4) (0·005%) which was identical to a commercial sample as determined by NMR, IR and MS comparison. Continued elution gave *p*-hydroxybenzyl alcohol, mp 115–116° (0·002%) also identical in all respects (NMR, IR, MS) to an authentic sample. *p*-Hydroxybenzaldehyde appears to be the active component of the extract, which shows moderate antimicrobial activity against *Vibrio anguillarium*, *Candida albicans*, and *Staphylococcus aureus*.

Acknowledgements—The authors express appreciation to Mr. Jim Norris, Marine Science Institute, University of California, Santa Barbara, for an accurate taxonomic assignment of this alga and thank the captain and crew of the R/V DOLPHIN for aid in collection.

Phytochemistry, 1976, Vol 15, p. 436. Pergamon Press. Printed in England.

LIPID AND PHENOLIC CONSTITUENTS OF *TECOMA RADICANS*

TEMPLE U. OKARTER, PAUL L. SCHIFF, JR., JOSEPH E. KNAPP and DAVID J. SLATKIN
Department of Pharmacognosy, School of Pharmacy, University of Pittsburgh, Pittsburgh, PA 15261 U.S.A

(*Received* 25 *July* 1975)

Key Word Index—*Tecoma radicans*; Bignoniaceae; *n*-alkanes; squalene; *n*-alkanols; salicylic acid; 3,4,5-trimethoxycinnamic acid; ferulic acid; ursolic acid.

Plant. Tecoma radicans (L.) Juss; *Source.* Lafayette County, Mississippi, USA. *Previous work.* Carotenoid flower pigments [1], boschniakine [2]. *Present work.* The dried, ground leaves (3·6 kg) were extracted by percolation with EtOH. After removal of the solvent, *in vacuo*, at 40° the residue (235 g) was partitioned between 2% HCl and $CHCl_3$ to give basic (7·8 g) and non-basic (210 g) fractions. The non-basic fraction was fractionated by standard methods into neutral (98·2 g), acidic (4·8 g), and phenolic (57·0 g) fractions.

Neutral fraction. Chromatography over silicic acid and elution with light petrol gave an alkane fraction which crystallized from MeOH (23 mg); mp 61–63°; ν_{max}^{KBr} cm^{-1}: 2940, 2870, 1465, 1380, 730 and 720. GLC on 160 cm column of 3·0% OV-101 on Gas Chrom Q (80–100 mesh) showed the mixture to be composed primarily of C_{23}–C_{31} *n*-alkanes; C_{23} (6%), C_{24} (13), C_{25} (10), C_{26} (4), C_{27} (12), C_{28} (9), C_{29} (30), C_{30} (10), C_{31} (15). The identity was confirmed by GC–MS.

Elution with light petrol–$CHCl_3$ (4:1) afforded a fraction which was rechromatographed over silicic acid. Elution with light petrol gave squalene; ν_{max}^{KBr} cm^{-1}: 2990, 2940, 2870, 1670, 1440, 1375, 1105, 985, 890 and 830; MS: M+ *m/e* 410 (7%), 395 (10%), 367 (3), 341 (10), 149 (40) and 136 (100). Direct comparison (IR, MS, NMR) with an authentic sample confirmed the identity.

Elution with light petrol–$CHCl_3$ (2:1) gave a fraction which was rechromatographed over silicic acid. Elution with light petrol–$CHCl_3$ (7:3) afforded an *n*-alkanol fraction which crystallized from light petrol (14 mg); mp 82–83°; ν_{max}^{KBr} cm^{-1}: 3400 (broad), 2940, 2870, 1465, 1060, 730 and 720; GLC of the TMS ethers on 160 cm column of 3% OV-17 on Gas Chrom Q (80–100 mesh) showed the mixture to be composed of C_{25}-C_{31} *n*-alkanols: C_{25} (3%), C_{26} (4), C_{27} (21), C_{28} (46), C_{29} (14) C_{30} (7), C_{31} (3). The identity was confirmed by GC–MS of the TMS ethers.

Acidic fraction. Chromatography over silicic acid and elution with light-petrol–$CHCl_3$ (1:1) gave salicylic acid (45 mg), mp 155–156° (light petrol); ν_{max}^{KBr} cm^{-1}: 3000 (broad), 1655, 1612, 1580, 1485, 1440, 1295, 1250, 1210, 1160, 1030, 760, 695 and 660. Direct comparison (mp, mmp, IR, MS) with an authentic sample confirmed the identity. Elution with light petrol–$CHCl_3$ (3:7) afforded 3,4,5-trimethoxycinnamic acid (15 mg), mp 123·5–124·5° (light petrol–EtOAc); ν_{max}^{KBr} cm^{-1}: 3000 (broad), 1690, 1625, 1580, 1500, 1450, 1400, 1330, 1285, 1250, 1200, 1120, 1000, 980 and 830. Direct comparison (mp, mmp, IR, MS) with an authentic sample confirmed the identity. Elution with light petrol–$CHCl_3$ (1:4) yielded ferulic acid (65 mg), mp 167·5–169·5° (light petrol–EtOAc); ν_{max}^{KBr} cm^{-1}: 3460, 3000 (broad), 1680, 1620, 1590, 1510, 1435, 1275, 1205, 1040, 940, 855 and 805. Direct comparison (mp, mmp, IR. MS) with an authentic sample confirmed the identity.

Elution with MeOH–$CHCl_3$ (4:96) afforded ursolic acid (135 mg), mp 257° (EtOH); ν_{max}^{KBr} cm^{-1}: 3460 (broad), 2945, 2895, 1690, 1450, 1380, 1370, 1030 and 995. Direct comparison (mp, mmp, IR, MS) with an authentic sample confirmed the identity.

Acknowledgements—The authors are grateful to Mr. John Naworal, Graduate School of Public Health, University of Pittsburgh for determining the mass spectra. This investigation was supported in part by Research Grant 5SO1RR05455-10 from the National Institutes of Health Education and Welfare, Bethesda, Maryland 20014. The mass spectrometer facility was supported by Research Grant RR-00273 to the University of Pittsburgh from the National Institutes of Health.

REFERENCES

1. Grangaud, R. and Garcia, I. (1952) *Compt. Rend. Soc. Biol.* **146**, 1577.
2. Gross, D., Berg, W. and Schütte, H. R. (1972) *Phytochemistry* **11**, 3082.