2,4-Diketo-3-(phenylazo)pentane (3 ; R=H) and 2,4-diketo-3-(*o*-fluorophenylazo)pentane (3 ; R=F) were synthesised similarly (Table 1).

TABLE 1—PHYSICAL DATA OF COMPOUNDS 3*

Sl. no	R	M p °C	Yield %	Colour	Mol. formula
1.	H	98	86 0	Golden yellow	$C_{11}H_{12}N_2O_2$
2.	Cl	112	64 5	Yellow	$C_{11}H_{11}ClN_2O_2$
3.	F	108	78 8	Pale yellow	$C_{11}H_{11}FN_2O_2$

*All compounds gave satisfactory elemental analyses.

1-(Anilinomalonyl)-3,5-dimethyl-4-(o-chlorophenylazo)pyrazole (**5j**) : 2,4-Diketo-3(*o*-chlorophenylazo)pentane (0.238 g, 0.001 mol) and malonanilic acid hydrazide (0.193 g, 0.001 mol) were dissolved in glacial acetic acid (5 ml) and the mixture was refluxed for 10 h. The resulting solid was purified by repeated washing with boiling acetic acid and crystallised as pale yellow crystals, (35.4%), m.p. 276° (Found : C, 60.74 ; H, 4.50 ; N, 17.80. $C_{20}H_{18}ClN_5O_2$ calcd. for : C, 60.75 ; H, 4.55 ; N, 17.69%). Other derivatives were obtained by the same procedure (Table 2).

TABLE 2—PHYSICAL DATA OF 1-SUBSTITUTED-ANILINOMALONYL)-3,5-DIMETHYL-4-(SUBSTITUTED-AZO) PYRAZOLES (5)*

Compd no	R	R'	Molecular formula	M.p.* °C	Yield %
a	H	H	$C_{20}H_{19}N_5O_2$	209	46 1
b	H	o-CH_3	$C_{21}H_{21}N_5O_2$	171	41 0
c	H	*m*-CH_3	$C_{21}H_{21}N_5O_2$	229	38.7
d	H	*p*-CH_3	$C_{21}H_{21}N_5O_2$	247	49 6
e	H	o-OCH_3	$C_{21}H_{21}N_5O_3$	265d	32 7
f	H	*m*-OCH_3	$C_{21}H_{21}N_5O_3$	237	30 3
g	H	*p*-OCH_3	$C_{21}H_{21}N_5O_3$	234	44.4
h	H	o-Cl	$C_{20}H_{18}ClN_5O_2$	226	37 3
i	H	*p*-Cl	$C_{20}H_{18}ClN_5O_2$	277d	52.0
j	Cl	H	$C_{20}H_{18}ClN_5O_2$	276d	35 4
k	Cl	*p*-CH_3	$C_{21}H_{20}ClN_5O_2$	270d	48 8
l	Cl	o-OCH_3	$C_{21}H_{20}ClN_5O_3$	265d	44.4
m	Cl	o-Cl	$C_{20}H_{17}Cl_2N_5O_2$	262d	56 9
n	Cl	*p*-Cl	$C_{20}H_{17}Cl_2N_5O_2$	264d	37 2
o	F	H	$C_{20}H_{18}FN_5O_2$	278d	30 3
p	F	o-OCH_3	$C_{21}H_{20}FN_5O_3$	260d	73 3
q	F	*m*-OCH_3	$C_{21}H_{20}FN_5O_3$	234d	55 2
r	F	*p*-OCH_3	$C_{21}H_{20}FN_5O_3$	261d	41.5
s	F	o-Cl	$C_{20}H_{17}ClFN_5O_2$	258d	48 9
t	F	*p*-Cl	$C_{20}H_{17}ClFN_5O_2$	272d	36 3

*All compounds gave satisfactory N analysis. **Solvent for crystallisation : Compounds **a**–**i** were crystallised from aqueous acetic acid and the rest were purified by repeated washing with hot acetic acid.

The pyrazole derivatives gave characteristic ir bands at 3 015 (CH aromatic), 2 960–2 870 (CH aliphatic), 1 670–1 620 (C=O, β-diketone), 1 595, 1 510, 1 460 (C=C), 1 540 (N=N), 1 470–1 370 (CH_3 bending) and 750 cm^{-1} (monosubstituted benzene).

Acknowledgement

The authors thank the authorities of National Cancer Institute, Maryland, U.S.A., for anti-HIV activity testing and G. R. Medical College, Gwalior, for bacteriostatic studies, and feel indebted to the Director, D.R.D.E., Gwalior, for spectral analysis.

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Chemical Constituents and Antimicrobial Activity of *Achyranthes bidentata*†

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Manuscript received 10 April 1989, revised 27 July 1990, accepted 12 October 1990

ACHYRANTHES bidentata Blume (Fam : Amaranthaceae), native to temperate and sub-tropical Himalayas, occurs in Nainital upto 2500 m. The plant is also distributed in China, Java and Japan[1]. The plant has got medicinal importance[2]. We have investigated the alcoholic extract of the roots of plant for chemical constituents and antimicrobial activity, and the results are presented in this communication.

Experimental

The roots of the plant were collected from Nainital. The air-dried, powdered material (250 g) was extracted successively with petroleum ether and 90% ethanol in a Soxhlet for about 12 h. The ethanolic extract was cooled, filtered and concentrated. The concentrate ethanolic extract was then chromatographed on silica gel G tlc plates and/or Whatmann No. 1 or 3 papers. The developed chromatograms were inspected under uv light, sprayed with various reagents[3] for different types of compounds and revealed the presence of amino acids, steroids triterpenoids, alkaloids and coumarins.

To find out the diet value of the plant with respect to amino acid content, the root extract was further investigated and free amino acids were determined[4,5]. The concentrate ethanolic extract was analysed chromatographically employing Whatmann No. 1 or 3 papers (88.5×22.5″ ; 24 h at 18±2°), silica gel G or cellulose layer (MN 300) as stationery phase and 1-butanol–acetic acid–water

†Paper presented in the 25th Annual Convention of Chemists, at Calcutta, 1988.

TABLE 1 – PHYSICOCHEMICAL PROPERTIES OF AMINO ACIDS

Property	Products obtained													
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
R_f values (×100)														
(i) BAW	9 1	12.5	13.5	14 4	15 8	16.2	19 0	24.5	40 1	46 1	53 1	54 0	56 2	59 6
(ii) BAPW	37.2	41.6	42 0	43 8	45 3	46 4	50.4	52 6	66 8	70.2	71 2	72 5	73 1	74 8
Colours* with														
(i) Ninhydrin	V	BV	Gr	V	RV	Y	V	V	Br V	V	V	BV	Y	V
(ii) Isatin	P	dB	P	BP	P	B	P	PB	R	P	PB	PB	V	RV
Fluorescence in uv light	BW	W		BW	W	BW	BW	BW	BW	BW	BW	BW	—	BW
On spot in chromatography with amino acid	Arg	Asp		Ser	Gly	Pro	Glu	Threo	Tyr	Val	Try	Phe	—	Leu
Amino acid identified	Arg	Asp	—	Ser	Gly	Pro	Glu	Threo	Tyr	Val	Try	Phe	—	Leu
Amount (μg/g) of sample	7.2	0.5	—	1.7	7 2	8 6	9.2	5 3	8 2	6 5	7 6	9 8	—	9 7

*V=Violet, B=blue, R=red, P=pink, Gr=green, Br=brown, Y=yellow, W=white, dB=dull blue.

(4 : 1 : 1, v/v ; BAW) or 1-butanol – acetic acid – pyridine – water (15 : 3 : 10 : 12, v/v ; BAPW) as solvent systems. The authentic amino acids were run concurrently alongside of the concentrate as reference standards. The chromatogram was dried in air and then at 110°, examined under uv lamp[5] (350 mm) for marking fluorescent spots and eluted with water for further characterisation. For locating and characterising the resulting products, ninhydrin (0.1 g/100 ml acetone), alloxan (0.2 g/100 ml acetone), isatin (0.2 g/100 ml acetone) and Folin's reagent (0.2%1 – 2 naphthaquinone-4-sulphonate in 5% aqueous sodium carbonate) were used as chromogenic reagents. Twelve amino acids isolated were identified as arginine, glycine, serine, aspartic acid, glutamic acid, threonine, proline, tyrosine, tryptophan, valine, phenyl alanine and leucine. All these amino acids were isolated as their ninhydrin complexes by preparative-pc on Whatmann no. 3 paper and their relative yield was determined colorimetrically[6] using a Systronics 106 spectrophotometer. The results are recorded in Table 1.

Antimicrobial activity : The minimum inhibitory concentration (MIC) was measured using agar dilution method. The extract was subjected to a series of dilution (1 : 10, 1 : 20, 1 : 30, 1 : 40, 1 : 60, 1 : 80, 1 : 100, 1 : 120, 1 : 160) in test tubes having melted, cooled (45°) agar water bath. The agar dilutions were poured into plates. When the agar became solid the organisms to be tested, i.e. standard strains of *E. coli*, *S. aureus*, *Ps. aeruginosa* and *P. mirabilis* were streaked on segments of agar surfaces and the plates were incubated. Effectiveness of the extract was indicated by failure of bacterial culture to grow which was compared with a control plate[7]. The results indicated that MIC of the extract for *E.coli* was 1 : 100 (10 mg ml^{-1}) and that for *Ps. aeruginosa* and *S. aureus* 1 : 80 (12.5 mg ml^{-1}).

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A New Xanthone of *Hoppea fastigiata*

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Manuscript received 20 August 1990, accepted 21 November 1990

In continuation of our studies on plant pigments[1], systematic chemical investigation of *Hoppea fastigiata* Clarke (Gentianaceae)[2] has been undertaken. The plant is used for a variety of ailments and has apparently not been chemically investigated earlier. In this communication we report the isolation and characterisation of a new xanthone, having rare substitution pattern.

The air-dried powdered whole plants (aerial parts and roots) of *H. fastigiata* were extracted with petroleum ether (b.p. 60 – 80°) and the concentrated extract was chromatographed over silica gel. Elution