

light on the geodynamics of Indian-Eurasian plate boundary.

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PRELIMINARY INVESTIGATION ON THE  
ANTIMICROBIAL ACTIVITY OF A  
PHYTOCHEMICAL, XANTHOCHYMOL  
FROM THE FRUITS OF *GARCINIA*  
*XANTHOCHYMUS* HOOK. f.

PLANTS are known to provide a vast reservoir of potential drugs and not more than 10% of these have so far been examined in detail for their biological activity<sup>1</sup>. Recently some phytochemicals were found to exhibit antifungal activity<sup>2-4</sup>. *Garcinia* Linn. (N.O. Guttiferae nom. alt. Clusiaceae) is a genus of evergreen trees or shrubs distributed in the lower hill forests of Eastern Himalayas<sup>5</sup>. The oil is useful in skin diseases and bark is used as astringent<sup>6-7</sup>. Baslas and Kumar<sup>8</sup> isolated some new compounds from the fruits of this plant and this communication briefly reports the antimicrobial activity of xanthochymol.

The air dried fruits of *G. xanthochymus* were extracted with benzene. A compound was isolated from the concentrated benzene extract with petroleum ether (40-60°C) and was crystallised by hot petroleum ether (60-80°C) as shining pale yellow needles (m.p. 122-124°C). Molecular formula was C<sub>36</sub>H<sub>50</sub>O<sub>8</sub>, molecular weight 602 and optical rotation +130 at 26°C. It was identified as xanthochymol by direct comparison of its IR, UV, NMR, and Mass spectra. The latest revised structure of xanthochymol by X-ray analysis<sup>9</sup> is shown in Fig. 1.

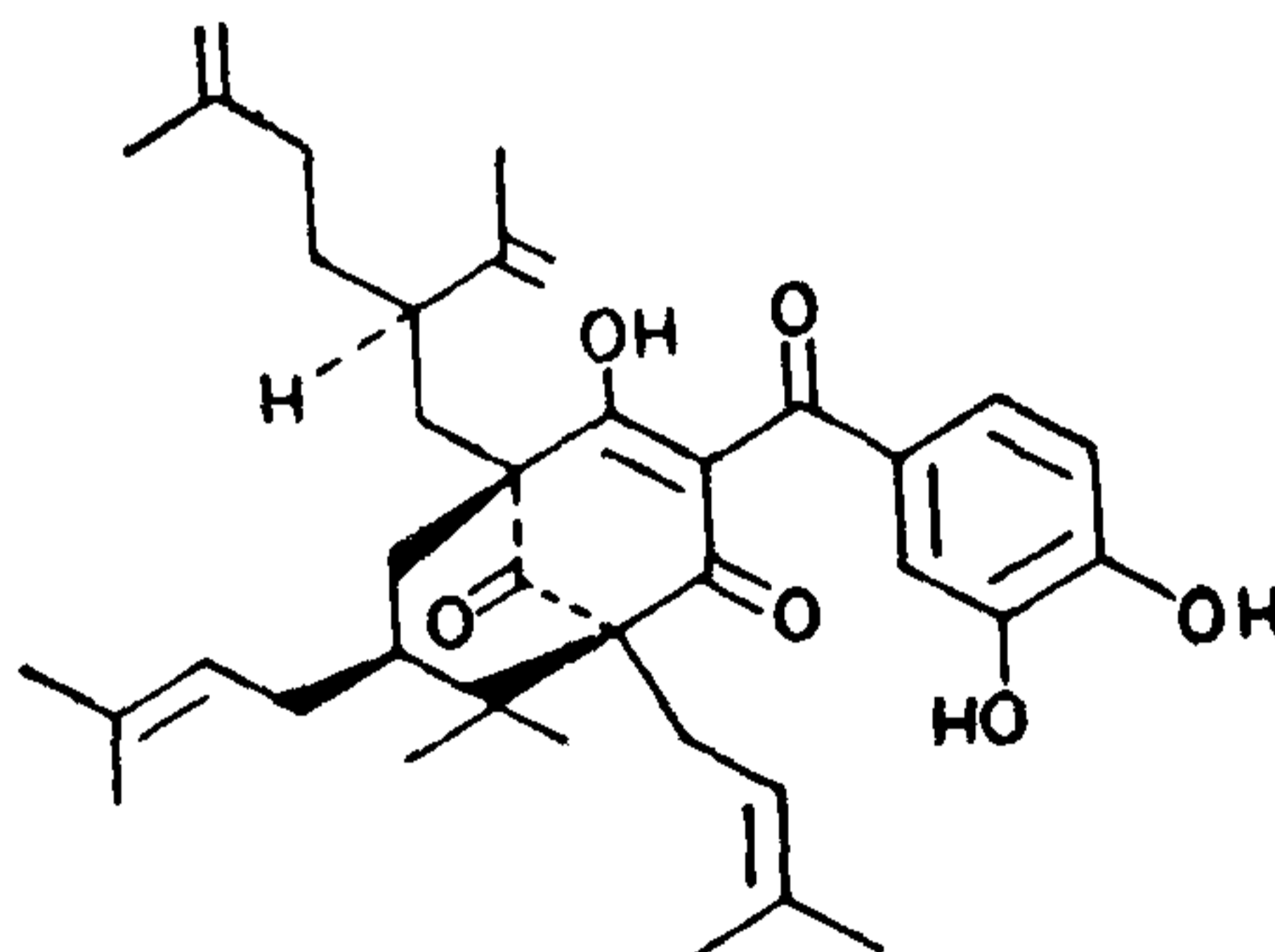


FIG. 1. Revised structure of xanthochymol by X-ray analysis after Blount and Williams (1976).

For a preliminary investigation of the antimicrobial activity of xanthochymol *in vitro*, two bacteria: *Streptococcus faecalis*, *Klebsiella pneumoniae* and three fungi: *Candida albicans*, *Trichophyton mentagrophytes* and *Aspergillus fumigatus* were used as test organisms following the method described by Dhar *et al.*<sup>10</sup>. Tetracycline and amphotericin B were used as standards for the comparison of antibacterial and

antifungal activity respectively. Xanthochymol exhibited good antibacterial activity and was superior to tetracycline against both the bacteria but it had poor antifungal activity as compared to amphotericin B (Table I). To our knowledge this is the first report dealing with the antimicrobial activity of xanthochymol.

Xanthochymol was also studied for a preliminary evaluation of its pharmacological properties. The cardiovascular effects were observed in anaesthetised (pentobarbitone sodium 40 mg/kg i.p.) cats (2-4 kg) of either sex. The compound was tested at 1.0, 2.5, 5.0 and 10.0 mg/kg i.v. doses and it was devoid of cardiovascular effects. The LD<sub>50</sub> of the compound was 1,000 mg/kg i.p. in mice. The compound showed no CNS effect at 1/5 LD<sub>50</sub> dose in mice.

TABLE I

In vitro antimicrobial activity of xanthochymol and standard drugs

Test Micro-organisms	Minimum inhibitory concn. (MIC) in µg ml <sup>-1</sup>	
	Xanthochymol	Standard Drugs
		Tetracycline
<i>Streptococcus faecalis</i>	0.78	3.125
<i>Klebsiella pneumoniae</i>	1.56	6.25
		Amphotericin B
<i>Candida albicans</i>	> 100.0	0.39
<i>Trichophyton mentagrophytes</i>	> 100.0	1.56
<i>Aspergillus fumigatus</i>	> 100.0	12.50

Antimicrobial principles have been reported from different parts of several plants but in the majority of cases the active principles are essential oils. Morellin, a crystalline compound isolated from the pericarp of the seeds of *Garcinia morella* possessed antimicrobial titre at 7.5-15 µg/ml<sup>11</sup>. Rao and Verma<sup>12</sup>, however, reported antibacterial activity of morellin at 1-2 µg/ml, it had low subcutaneous toxicity in experimental animals and extensive trials were carried out for its suitability for topical application. In our preliminary investigation xanthochymol showed better *in vitro* antibacterial activity than tetracycline and pharmacologically it did not reveal any adverse effects. Therefore, this phytochemical merits further detailed work.

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#### AN IMPROVED TECHNIQUE FOR CHROMOSOME STUDIES IN ORCHIDS

THE family Orchidaceae comprises the most highly evolved, morphologically complex groups of plants with a large number of species and varieties. The study of somatic chromosomes in orchids with special reference to karyotype analysis has been found to be rather difficult due to the presence of heavy cyto-