rapidly heated emitter is the only technique which could desorb the intact molecule along with potassium or sodium and thus gave cluster ion peaks at 272(P_2S-I), 380(Toxogonin-II) and 468(TMB-4-III). However these peaks are of comparatively low intensity (raw intensity of less than 2% in this spectrometer computer system) and thus could not give any isotope peaks.

The results suggest, the FD, FAB and rapidly heated FD emitter technique can be adopted as complimentary to each other for elucidating characteristic mass spectral peaks of such oximes.

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ANTIMICROBIAL ACTIVITY OF SULPHONYLCHALCONES AND SULPHONYLCYCLOHEXENONES

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BENZALACETOPHENONE (Chalcone) and its substituted derivatives have antibacterial[1-3], antifungal[4], antiparasitic[5], antitubercular[6], antiinflammatory[7] and insect repellent properties[8]. Studies on the structure-activity relationship of clavacin[9-12] and penicillic acid[13] indicate that such a structure as $-C=C-C=O$ that is found in chalcone, clavacin and penicillic acid is responsible for the development of antifungal and antibacterial activities. This structural feature is present in both the α-sulphonyl-chalcones (**1–10**) and sulphonylcyclohexenones (**11–20**), the synthesis of which would be published elsewhere. In the present investigation the antimicrobial activity of these compounds is assayed.

Ten mg of different α-sulphonylchalcones and sulphonylcyclohexenones which were insoluble in water were dissolved in the minimum required quantity of acetone. Twenty sterile Whatman filter paper No. 1 discs of 6 mm diameter were added to the solution and shaken thoroughly. The filter discs were allowed to dry and the amount of substance per paper disc was taken as 500 μg. Paper discs treated with acetone alone served as the control. The antibacterial activity was assayed[14] against *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli*, *Proteus vulgaris* and *Candida albicans*. The filter paper discs treated as above were placed aseptically on nutrient agar plates seeded with test organisms and incubated at 37° for 24 h. The zone of inhibition of bacterial/yeast growth was measured.

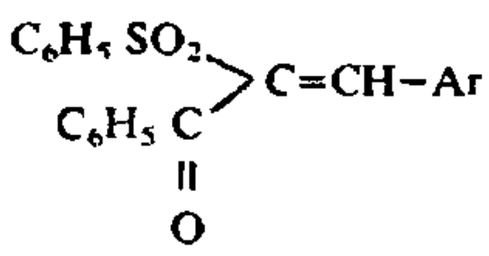
Antifungal activity of the α-sulphonylchalcones and sulphonylcyclohexenones was assayed against two fungi—*Alternaria alternata* and *Curvularia lunata* following the procedure of Horsfall and Rich[15] with certain modifications. One mg of different test compounds was dissolved in 1 ml acetone (0.1%) and an aliquot (0.25 ml) was taken with a micropippette on demarcated area of microscopic slides. The solvent was allowed to evaporate leaving a deposit of the test compound on the top of the slide. Then the spore suspension (0.1 ml) was taken with a sterile pippette and deposited over the demarcated area of the test compound on slides. The areas were closed with cover slips. Suitable controls were kept using acetone dried area over slides. The spore suspension was adjusted to give 30–50 conidia per lower field (100×) of the microscope. The slides were incubated in a moist chamber at 20–25° for 24 h.

The percentage inhibition of conidial germination was calculated by the formula:

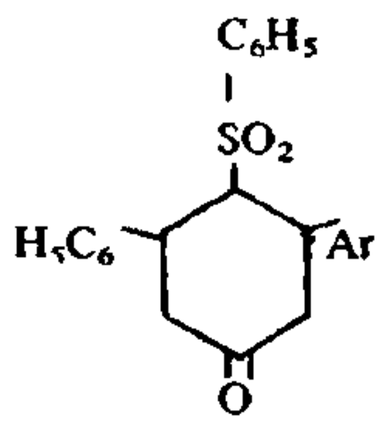
$$\text{Percentage of spore germination inhibition} = 100 - \frac{\text{Percentage of spore germination in the treatment}}{\text{Percentage of spore germination in the control}} \times 100.$$

The α-sulphonylchalcones were active against gram positive bacteria (*S. aureus* and *B. subtilis*) and inactive against the gram negative bacteria (*E. coli* and *P. vulgaris*) (table 1). The sulphonylcyclohexenones possessed no activity either against the gram positive or gram negative bacteria. This may be due to the phenylsulphonyl moiety being present at a position to the carbonyl group while in the α-sulphonylchalcones it is to the carbonyl group.

Table 1 *Effect of different derivatives of α-sulphonylchalcones and sulphonylcyclohexenones on the growth of bacteria and on the spore germination of fungi*



(2-phenylsulphonyl-1-phenyl-3-aryl-2-propen-1-ones)
1–10



(4-phenylsulphonyl-3-phenyl-5-aryl-2-cyclohexen-1-ones)
11–20

Compound no.	Substituent Ar	Bactericidal activity zone of inhibition (mm)		Fungicidal activity inhibition of spore germination (%)	
		S. aureus	*B. subtilis*	*A. alternata*	*C. lunata*
1	C_6H_5	8	7	73.1	100
2	4-Cl C_6H_4	10	8	81.3	100
3	4-Br C_6H_4	7	7	56.7	100
4	4-F C_6H_4	10	9	63.3	85.5
5	4-NO_2 C_6H_4	10	7	50.4	72.3
6	4-OCH_3 C_6H_4	7	7	58.7	100
7	4-CH_3 C_6H_4	8	9	28 0	31.4
8	3,4-$(O_2CH_2)C_6H_3$	7	8	68.4	100
9	2-Cl C_6H_4	7	7	89.2	100
10	2,4-Cl_2 C_6H_3	7	9	94.6	100
11	C_6H_5	—	—	58.9	75
12	4-Cl C_6H_4	—	—	57.6	100
13	4-Br C_6H_4	—	—	68.0	56
14	4-F C_6H_4	—	—	61.1	85.2
15	3-NO_2 C_6H_4	—	—	20 0	81.0
16	4-OCH_3 C_6H_4	—	—	89.5	42.0
17	4-CH_3 C_6H_4	—	—	82.6	62.1
18	3,4-$(O_2CH_2)C_6H_3$	—	—	80.0	39.5
19	2-Cl C_6H_4	—	—	59.1	100
20	2,4-Cl_2 C_6H_3	—	—	64.3	100

— indicates no activity; None of the compounds exhibited any activity against *E. coli*, *P. vulgaris* and *C. albicans*.

Neither the α-sulphonylchalcones nor the sulphonylcyclohexenones showed any activity against yeast.

All the compounds exhibited remarkable antifungal activity. They were in general more effective against *C. lunata* than against *A. alternata*. The activity increased when the substituent is in the ortho position. The nitro substituted compound was less active than the halogen substituted compounds.

These compounds tested in the present study appear to be superior to simple chalcone (benzalacetophenone) in their fungicidal activity and may find use in fungicide formulation.

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MANIFESTATIONS OF THE KURDUWADI LINEAMENT BASED ON REMOTE SENSOR DATA INTERPRETATION

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INDEPENDENT investigations, based on aerial photograph and Landsat MSS imagery interpretations, in two widely separated areas, have brought to light very interesting surface manifestations of the geophysically inferred 'Kurduwadi Rift'[1]. Remote sensing based geological studies were carried out in the Late Proterozoic Bhima Group of northern Karnataka and western Andhra Pradesh states, and the associated Precambrian crystalline rocks; in the region bounded by latitudes 16° 15′ N to 17° 30′ N and longitudes 76° 00′ E to 77° 45′ E[2]. Photogeological investigations of the Deccan Traps of the northern parts of the Konkan coastal strip of Maharashtra state were undertaken[3] following reports of reservoir-induced seismicity around Khardi (19° 35′ 13″ N; 73° 22′ 02″ E) in the recent years[4,5].

A major NW-SE trending fault ('A' in figure 1) cuts across the Bhima sediments over a distance of more than 15 km between Chikalur and Gola[6] and is represented by a 250 m wide disturbed zone around Wadi. This fault has brought the crystalline basement rocks in the southwestern upthrown block into direct contact with the tightly folded Bhima limestones, which show dips of up to 80° in the vicinity of the fault zone. Recent field studies have shown the same fault zone to extend more than 15 km further northwestward, north of Farhatabad (on the Gulbarga–Jewargi road, 16 km from Gulbarga); where it is observed as a 100 m wide brecciated zone, flanked by intensely deformed Bhima sediments.

Landsat imagery interpretations suggested a further southeastward extension of this fault lineament through the Precambrian Gneissic terrain ('B' in figure 1). It is represented by a NW-SE trending shear zone around Narayanpet. North and northeast of Yadgir, quartz-veins (currently being quarried) have been emplaced along this shear zone. Further southeastward, the lineament becomes syntaxial with the Raichur schist belt of the western Dharwar craton[7].

The Deccan Trap basaltic flows in the Khardi region of Thana district, ('C' in figure 1) are dissected by a network of lineaments, which show azimuth in the NW-SE direction and a submaxima in the N-S direction. Dykes intruding the basaltic flows are oriented either in the NW-SE or N-S directions. Vertical dislocations of the flows are observed along three of the major NW-SE trending lineaments, while most of the interpreted lineaments represent regional fracture zones and dykes.

The N-S trending Western Ghat escarpment displays a prominent kink, west of Junnar, noticeable not only on the Landsat imageries but also on any of the relevant topographic maps ('D' in figure 1). The Ghod river valley, near Junnar, flows through the Traps which are transected by NW-SE trending megafracture zones. The regional drainage system (of rivers Bhima and Sina) between Junnar and Kurduwadi displays a subparallel, southeastward flow, suggesting implicit structural control over the drainage development. The parallel orientations of the steeper topographic surfaces along this region[8] is significantly consistent.

This linear zone, marking the alignment between the Khardi area and the major fault/shear zone