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 (pentobarbetone 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_{50} of the compound was 1,000 mg/kg i.p. in mice. The compound showed no CNS effect at 1/5 LD_{50} dose in mice.

TABLE I

In vitro *antimicrobial activity of xanthochymol and standard drugs*

Test Micro-organisms	Minimum inhibitory concn. (MIC) in $\mu g\ ml^{-1}$	
	Xantho-chymol	Standard Drugs
		Tetracycline
Streptococcus faecalis	0·78	3·125
Klebsiella pneumoniae	1·56	6·25
		Amphotericin B
Candida albicans	>100·0	0·39
Trichophyton mentagrophytes	>100·0	1·56
Aspergillus fumigatus	>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 $\mu g/ml$[11]. Rao and Verma[12], however, reported antibacterial activity of morellin at 1–2 $\mu g/ml$, 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-

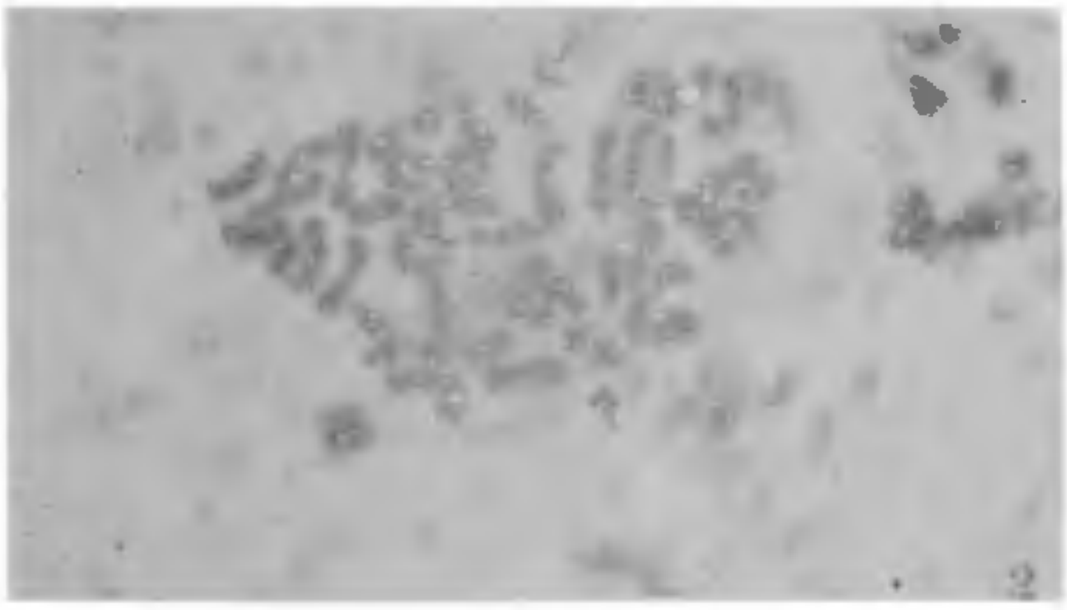
plasmic content and short chromosomes[1,3,4]. The possibility of their improvement, cultivation and export can only be worked out, provided a complete spectrum of genetic variance is fully understood from a cytological standpoint.

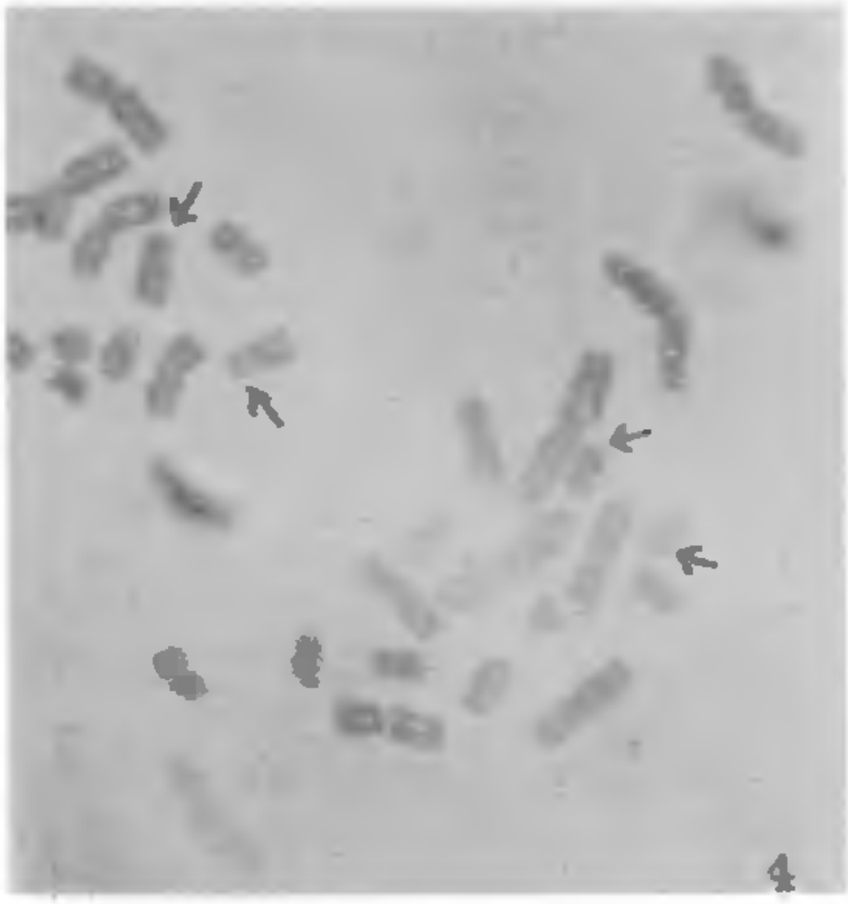
Several methods have been adopted for somatic chromosome analysis and a number of chemicals has been suggested for better pretreatment[1,3,4-7]. In the present investigation, for the study of somatic chromosomes young, healthy root tips were selected and split longitudinally into 2–6 parts, according to their thickness, for penetration of the pretreating chemicals and clarification of both the cytoplasmic background and individual chromosome morphology. The young velamen tissues were removed as far as possible. The best results were obtained by pretreating the root tips with a mixture of saturated aqueous solutions of paradichlorobenzene (PDB) and 8-hydroxyquinoline (0·002M) (OQ) in varying proportions. In certain species paradichlorobenzene along with 2–4 drops 0·25% colchicine (Colch.) was found to be effective. Pretreatment was carried out at 10–15°C for one to three hours. The root tips were then washed in distilled water and kept at room temperature in propionic acid ethanol mixture (1 : 2) for 45 min and then transferred to 45% propionic acid for 5–15 minutes. For staining and squashing the usual propiono-orcein NHCl technique was followed. Subsequently the slides were sealed and observed. A total of 42 species under 18 genera from the Eastern Himalayas were worked out. The optimum pretreatment schedules for different genera and species are given below (Table I).

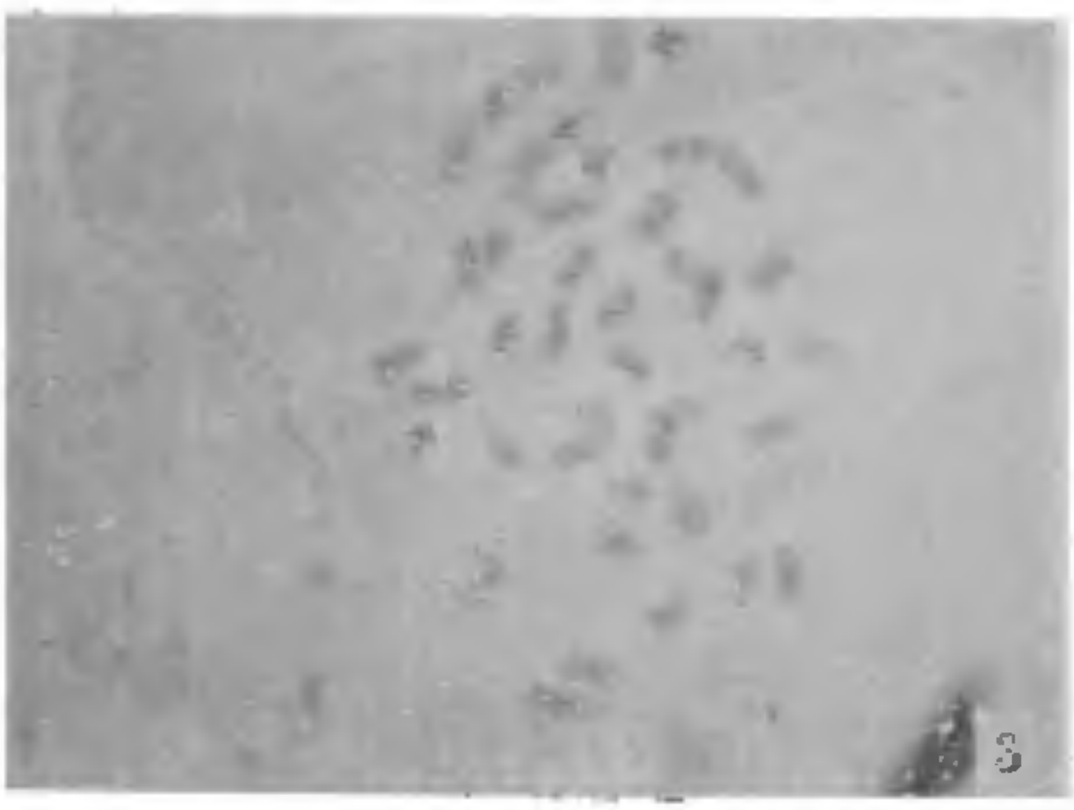
TABLE I

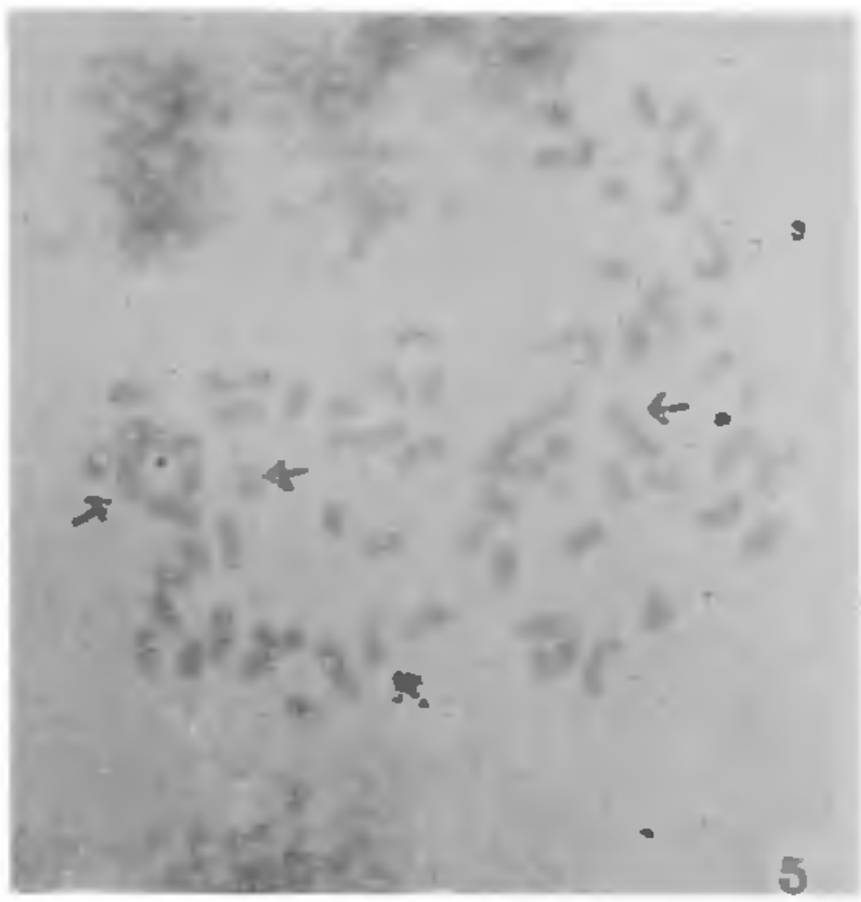
Name of the genera	Pretreatment		
	Pretreating chemicals	Temperature (°C)	Duration (hour)
Paphiopedilum Pftz. 4 species	pDB + Colch. (2–4 drops) pDB + OQ (2 : 1)	10–12	$1\frac{1}{2}$–$2\frac{1}{2}$
Habenaria Willd.	pDB + OQ (4 : 1)	12–15	1
Pogonia Griff. 2 species	pDB + OQ (2 : 1)	12–15	3
Goodyera R. Br.	do.	10–12	$2\frac{1}{2}$
Tropidia Lindl.	pDB + Colch. (2–4 drops)	10–12	$2\frac{1}{2}$
Microstylis Nutt. 3 species	pDB + OQ (1 : 1, 1 : 2, 2 : 1)	10–15	$2\frac{1}{2}$
Liparis Richard 2 species	pDB + OQ (2 : 1, 4 : 1)	10–12	$1\frac{1}{2}$–$2\frac{1}{2}$
Tainia Blume 2 species	pDB + OQ (4 : 1, 2 : 1)	10–12	$1\frac{1}{2}$–$2\frac{1}{2}$
Pleione D. Don.	pDB + OQ (2 : 1)	10–12	$2\frac{1}{2}$
Arundina Blume. 2 species	pDB + OQ (3 : 1)	10–12	$2\frac{1}{2}$
Eria Lindl. 5 species	pDB + OQ (3 : 1, 2 : 1, 4 : 1)	10–12	$2\frac{1}{2}$–3
Acanthophippium Blume	pDB + OQ (4 : 1)	12–15	$2\frac{1}{2}$
Bulbophyllum Thou. 4 species	pDB + OQ (1 : 2, 3 : 1, 4 : 1)	10–15	$2\frac{1}{2}$–3
Cirrhopetalum Lindl.	pDB + OQ (3 : 1)	12–15	2
Geodorum Jacks.	do.	10–12	3
Eulophia R. Br. ex Lindl. 2 species	pDB + OQ (3 : 1, 2 : 1)	10–12	$2\frac{1}{2}$–3
Cymbidium Sw. 7 species	pDB + OQ (1 : 1, 2 : 1, 3 : 1)	12–15	3
Cyperorchis Blume 2 species	pDB + OQ (1 : 2, 2 : 1)	10–12	3–$3\frac{1}{2}$

The techniques resulted in the clarification of minute details of chromosomes, including the nature and position of both primary and secondary constrictions or satellites (Figs. 1–5).









FIGS. 1–5. Microphotographs showing somatic metaphases of : Fig. 1. *Arundina sinensis*, Blume. $2n = 40$ (× 650 approx.), Fig. 2. *Cymbidium aloifolium*, Sw. $2n = 40$ (× 1000 approx.), Fig. 3. *Eria ferruginea* Lindl. $2n = 38$ (× 1600 approx.), Fig. 4. *Paphiopedilum spicerianum*, (Reichb f.), Pfitz. $2n = 30$ (× 450 approx.), Fig. 5. *Pogonia gamuniena*, Hook. f. $2n = 68$ (× 870 approx.).

Arrows indicate chromosomes with secondary constrictions or satellites.

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