+ δ NH_2) shows blue shift on coordination indicating the increased double bond character of C=N bond. The band observed at 630 cm^{-1} assignable to ν C–S clearly shows red shift in all complexes. These observations reveal the coordination of thioureas with the metal ion through sulphur. The above band assignments are in tune with those made by us earlier for similar complexes derived from d^{10} metal halides[12] and dioxouranium(VI) acetate.[13]. The bands recorded for νM–S (200–400 cm^{-1}) analogous to the reports of other workers[14, 15] also support sulphur coordination. The metal-halogen vibrations are also observed in far infrared region, as suggested by other investigators[16, 17].

The NMR study of La(III), Ce(III) complexes of phenyl thiourea indicates that the proton of imino group of this ligand (11·66 ppm, δ value) shows no shift for both complexes relative to free ligand. This observation favours sulphur bonding. The proton of NH_2 group in the above complexes as well as in the ligand are either insensitive in the NMR spectra or might have merged with aromatic peak (7·30 ppm, δ value).

The high coordination number (6 to 12) assigned to the above complexes speaks of the characteristic nature of lanthanide and actinide ions.

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AN EASY METHOD FOR THE ISOLATION OF FRUITING MYXOBACTERIA FROM VARIOUS SUBSTRATES

THE isolation procedures adopted for myxobacteria are very cumbersome on account of amoebal and fungal contaminants from soil. There are three basic procedures for the isolation of fruiting myxobacteria[1–4]. The aerobacter circle method has been further developed by incorporating actidion and nystatin in the non-nutrient agar (NNA) base[5–6]. The fungal contaminants have been avoided to a considerable extent but the soil amoebae were still posing a problem. The present communication describes a method for the isolation of fruiting myxobacteria where these contaminants could be avoided appreciably.

Twenty-two soil samples, 68 samples of dung of herbivorous animals and 29 samples of tree barks were used for the present study. The original methods of Krzemieniewski[3] and of Singh[4] were compared with the present method. The present method comprised of a NNA base in which actidion and nystatin (each 50 μg/ml) were incorporated in the medium. Twenty-four hour culture of red pigmented strain of *Serratia marcescens* was overlaid in the centre about 2.5 cm in diameter. This was inoculated with a pinch of the samples collected for the isolation of fruiting myxobacteria. The plates were incubated at 30 C for 5–7 days. The myxobacterial fruiting bodies developed at the expense of *Serratia marcescens* cells.

It was observed that in *Serratia marcescens* plate the soil amoebae were very few and were not in active stage of multiplication ; therefore, the picking up of

swarms of myxobacteria or their fruiting bodies which were luxuri nt and free from contaminants was much easier than from the other two media used. On Krzemieniewski plate[3], fungal contamination was a problem and on Aerobacter plate[4] soil amoebae and amoeboid organisms were the problems. The number of various species of myxobacteria isolated by these three methods are presented in Table I.

TABLE I

Number of fruiting myxobacterial spp. isolated by the three methods

Species of myxobacteria	No. of samples examined	Number of myxobacterial spp. isolated		
		Krzemieniewski plate	Singh and Singh plate	Serratia plate
Myxococcus spp.	119	33	55	55
Chondrococcus spp.	119	18	54	54
Angiococcus spp.	119	23	35	35
Archangium spp.	119	12	30	30
Stolangium spp.	119	3	3	3
Haploangium spp.	119	7	18	18
Polyangium spp.	119	1	2	2
Chondromyces spp.	119	42	38	38
Total	..	139	235	235

The total number of myxobacterial spp. isolated by Krzemieniewski's method gave a slightly different spectrum than 'Aerobacter plate' and 'Serratia plate'. The number of myxobacterial isolates from 'Aerobacter plate' and 'Serratia plate' were equal.

Although the number of myxobacterial species on Aerobacter and Serratia plate are one and the same yet the latter is much better in the sense that fruiting bodies are luxuri nt and mostly free from soil amoebae. The superiority of Aerobacter plate over Krzemieniewski plate[3] was reported earlier and the use of some other eubacterial species for the isolation of myxobacteria was recommended. It has been reported that soil amoebae are very selective in their bacterial food requirements[7]. Bacterial spp. are either readily eaten or partly eaten or not eaten at all by amoebae. *Aerobacter* sp. was one of the best foods for amoebae and amoeboid organism, whereas pigmented species of bacteria were mostly inedible by amoebae[7–8]. It was further reported that myxobacteria too were selective in their food requirements and unpigmented bacteria were more readily eaten than pgimented strains[4]. This was further confirmed by Singh and Yadava[6,9] that most of the pigmented species of bacteria were not lysed by myxobacteria. After screening a large number of eubacterial spp., yeast and yeast like fungi, it was found out that a red pigmented strain of *S. marcescens* was edible by all the myxobacterial species studied and was not readily edible by soil amoebae. Taking these facts into consideration, red pigmented strain of *S. marcescens* was tried for the isolation of myxobacteria on NNA plates with actidion and nystatin. This method has yielded much easier isolation than with Aerobacter plate, hence recommended for the isolation of myxobacteria.

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PROTON-LIGAND STABILITY CONSTANTS OF SALICYLOYL HYDRAZINE IN AQUO-ORGANIC MIXTURES

RECENT studies on the proton-ligand and metal-ligand equilibria in the presence of a co-solvent have revealed that the thermodynamic quantities[1–5] accompanying the chemical reactions are influenced to a greater extent by the solute-solvent interactions than those based on purely electro-static considerations. Further the equilibrium conditions for ligands containing both oxygen and nitrogen donor atoms are affected in different ways by the dielectric constant of the medium and the reports in literature have led to partially contradictory results[2,6–9]. In continuation of our studies on the ligand characteristics of aroyl hydrazines in non-aqueous media[10–11], we have taken up the study fo acido-basic equilibria of a bidentate salicyloyl