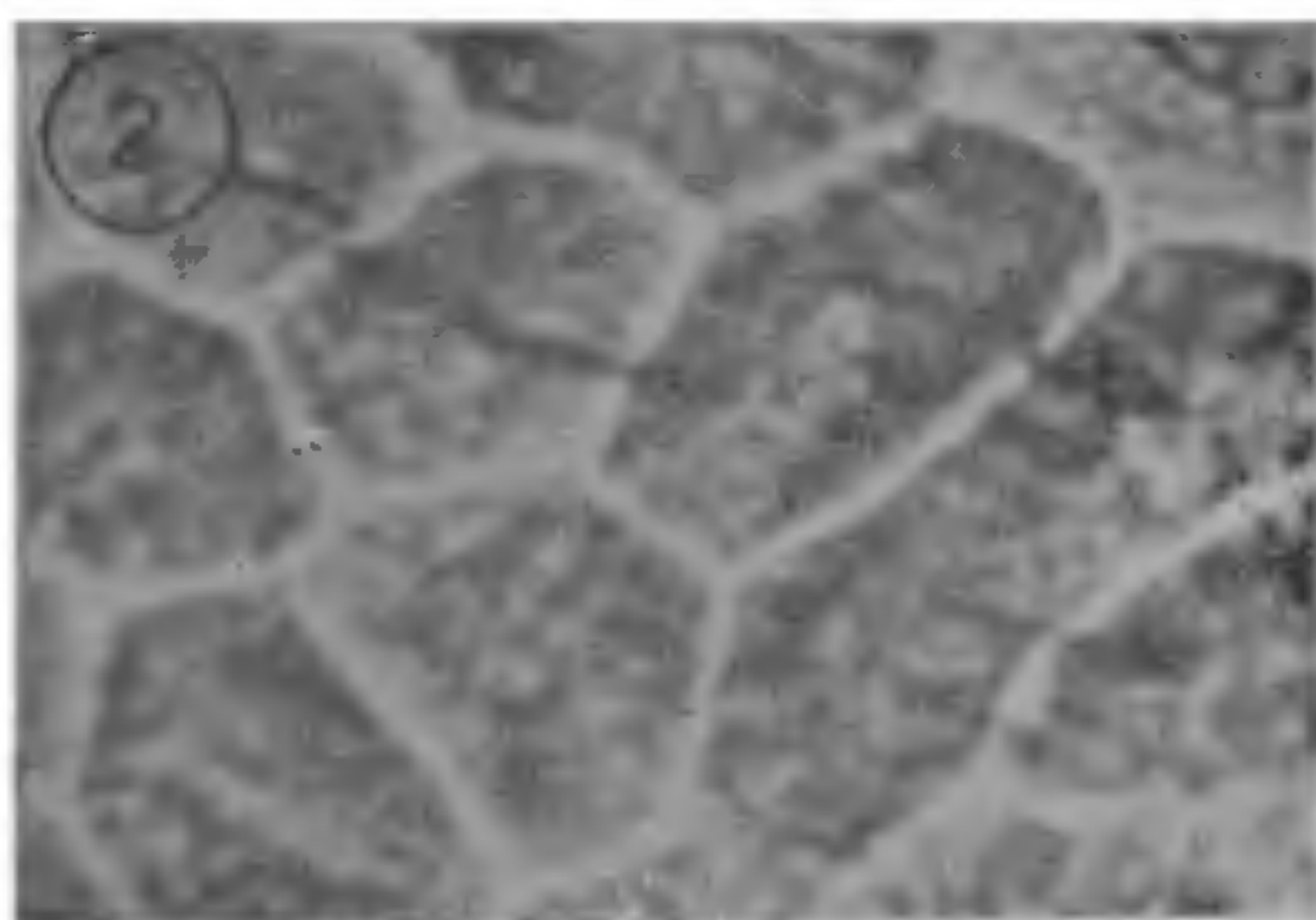
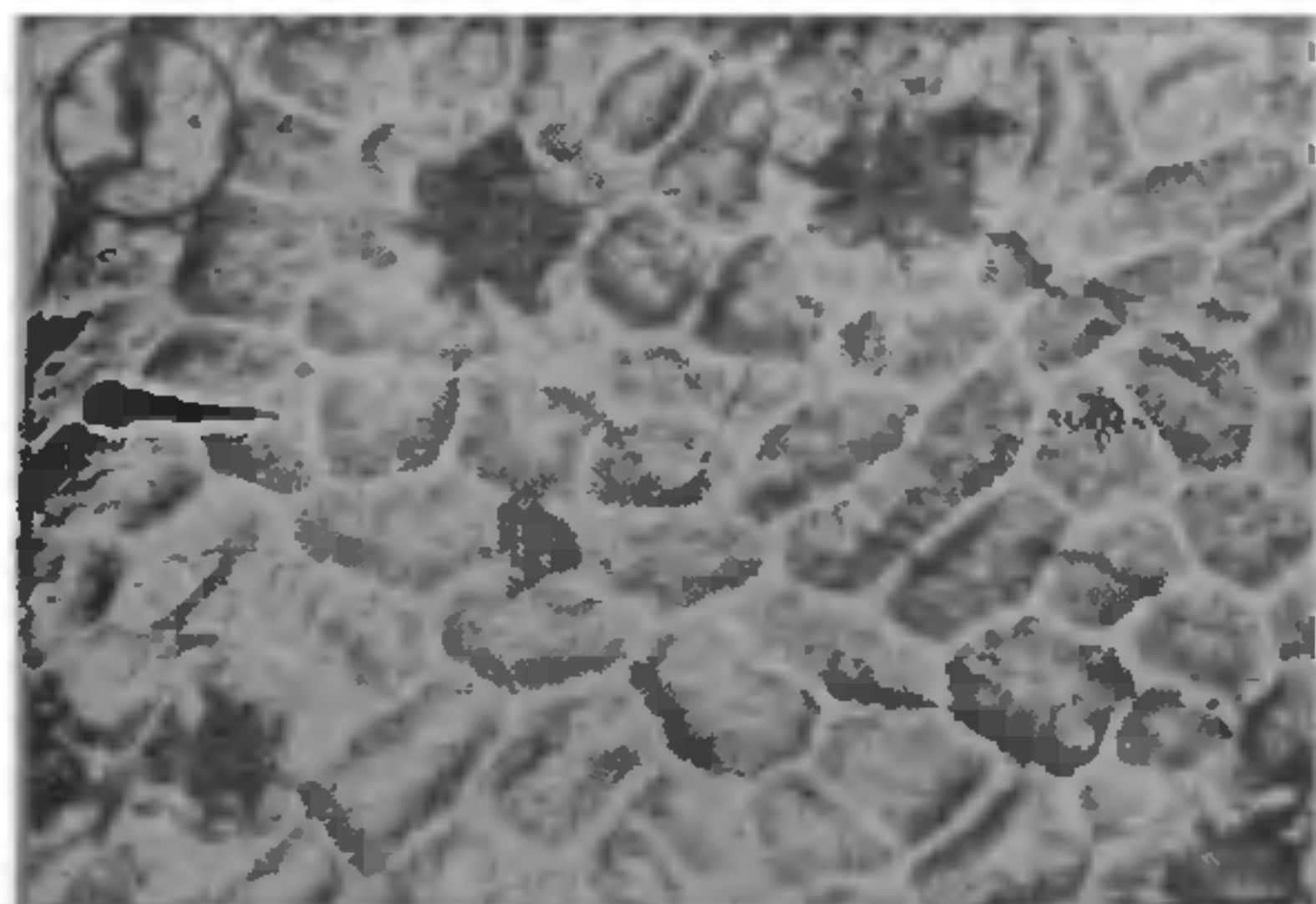


2. The surface to be coated is first washed with tap water and then with absolute alcohol to eliminate the foreign material.

3. A drop of the plastic solution is applied on the leaf surface. The solution spreads by itself and makes a uniform coating over the surface. It hardens up into a whitish translucent film when dried.

4. The film is then peeled off with forceps and placed on a dry microscope slide with the imprinted surface upward and covered with a clean cover glass by means of Quick fix on each corner.

The preparation is now ready for microscopic examination. The whole procedure is completed within 5-6 minutes. Results are quite satisfactory as shown in Figs. 1 and 2. In addition to the ease of application and removal, the plastic has an added advantage of being non-toxic to the tissues and hence repeated imprints can be obtained from the leaves *in situ* for various physiological studies.



FIGS. 1-2. Fig. 1. Epidermal imprint of the lower surface of *Rosa sinensis* leaf ($\times 190$). Fig. 2. A portion of the same magnified ($\times 525$).

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COMPARATIVE STUDY OF THE RELATIVE ORDER OF LIGAND FIELD STRENGTH IN COBALTIC COMPLEXES

TEMPERATURE independent paramagnetism (χ_p) values of the cobaltic complexes of the type $[\text{Coen}_2(\text{R})\text{Cl}]\text{Cl}_2$ where 'R' is an amine have been reported earlier by the authors¹. On the basis of Griffith and Orgel's² theory, the authors have theoretically calculated the χ_p values and reported³. NMR spectra of all these complexes were investigated. Their chemical shift values " σ " are determined⁴. Table I summarises all these values.

Discussion of the Results

One of the conclusions of the Griffith and Orgel's² theory is that the χ_p term should decrease as the ligand field strength increases. Therefore assuming χ_p values as a measure of ligand field strength an order of relative ligand field strength for various ligands can be expressed as under:—

1. Magnetic measurements

Dicyandiamide > pyridine > ortho-phenetidine > meta-toluidine > meta-chloroaniline > para-anisidine > ortho-chloroaniline > meta-anisidine > meta-phenetidine.

2. Spectrochemical data

Dicyandiamide > pyridine > ortho-phenetidine > meta-chloroaniline > para-anisidine > ortho-chloroaniline > meta-anisidine > meta-phenetidine > meta-toluidine.

3. NMR Data

Taking chemical shift " σ " values as a direct measure of ligand field strength the order of relative ligand field strength runs as:—

Dicyandiamide > pyridine > meta-toluidine > meta-anisidine > meta-chloroaniline > para-anisidine > ortho-phenetidine > meta-phenetidine > ortho-chloroaniline.

TABLE I

 χ_d values and NMR shifts of cobaltic complexes

Sl. No.	Formula of the complex (complexing ligand)	χ_d (Obs.) ¹	χ_d (Calc.) ³	σ° from NMR data ⁴
1.	[Coen ₂ (C ₂ H ₂ N ₄) Cl]Cl ₂ (dicyandiamide)	131.73	202.2	-0.713
2.	[Coen ₂ (C ₅ H ₅ N) Cl]Cl ₂ ·H ₂ O (pyridine)	153.24	208.3	-0.803
3.	[Coen ₂ (C ₆ H ₄ ·NH ₂ ·OC ₂ H ₅)Cl]Cl ₂ (ortho-phenetidine)	153.70	208.3	-0.822
4.	[Coen ₂ (C ₆ H ₄ ·NH ₂ ·CH ₃)Cl]Cl ₂ ·H ₂ O (meta-toluidine)	166.14	212.4	-0.818
5.	[Coen ₂ (C ₆ H ₄ ·NH ₂ ·Cl) Cl]Cl ₂ (meta-chloroaniline)	171.12	208.3	-0.821
6.	[Coen ₂ (C ₆ H ₄ ·NH ₂ ·OCH ₃)Cl]Cl ₂ ·H ₂ O (para-anisidine)	186.40	208.3	-0.821
7.	[Coen ₂ (C ₆ H ₄ ·NH ₂ ·Cl)Cl]Cl ₂ (ortho-chloroaniline)	208.39	210.4	-0.871
8.	[Coen ₂ (C ₆ H ₃ ·NH ₂ ·OCH ₃) Cl]Cl ₂ (meta-anisidine)	208.53	212.4	-0.818
9.	[Coen ₂ (C ₆ H ₄ ·NH ₂ ·OC ₂ H ₅)Cl]Cl ₂ (meta-phenetidine)	211.48	212.4	-0.830

It would be interesting to compare the relative order of ligand field strengths obtained by the three methods.

An examination of the results, given above, indicate that there is no complete agreement in the orders of ligand field strengths obtained by the three methods. Among the three methods the NMR is perhaps the most sensitive for establishing the relative order for various ligands since the accuracy of NMR measurements is much greater than the other two methods. For example, the absorption bands for the complexes of pyridine, orthophenetidine and meta-chloroaniline are all at 510 m μ ; however, the NMR shifts for the corresponding ligands are respectively 0.803, 0.822 and 0.821 for the three compounds. The magnetic method has a distinct disadvantage in the fact that a number of uncertainties are involved in obtaining the computed values by using the diamagnetic susceptibility values of the components in the complex molecule. An exact correlation in the orders of ligand field strengths by the three methods is therefore not possible. For the ligands, dicyandiamide and pyridine the agreement is good, since in every method these two ligands are heading the list. However, for the remaining ligands there is much variation. A somewhat partial agreement is indicated by the following ligands which may be expressed as

Dicyandiamide > pyridine > meta-chloroaniline > para-anisidine > meta-phenetidine.

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TWO TERRICOLOUS LICHENS FROM SOUTH WESTERN INDIA

IN the course of our investigations on the lichen flora of Western Ghats, India, we encountered two micro-lichens growing on calcareous soil in association with *Riccia* sp. at the Purandar Fort and Poona. On microscopic examination, these lichens were identified as *Dermatocarpon hepaticum* and *Endocarpon pusillum*. These two taxa constitute additions to the lichen flora of India and are therefore described and illustrated in this note specially because of their inconspicuous nature and their known distribution in the temperate regions of the northern hemisphere.

1. *Dermatocarpon hepaticum* (Ach.) Th. Fr. in *Nova Acta Reg. Soc. Sci. Upsal*, Ser. 3, 3: 555, 1861 (Figs. 1, 2).

= *Endocarpon hepaticum* Ach. *Kgl. Vetensk. Akad. Nya Handl.*, 1809, p. 156.

Thallus squamulose, closely adnate; upper surface dark or reddish brown, lower surface pale coloured with a few haptera like rhizoidal hyphae, distinctly corticated on both sides; upper cortex with vertical cell rows, 80–160 μ m thick, medulla cellular, hyaline; lower cortex composed of vertical row of cells, thinner than upper cortex; algae mostly in upper cortical layers; perithecia immersed, 300–400 μ m in diam., perithecial wall (exciple) thick, mostly colourless but dark brown near the dark ostiole; hymenium I–;