vivo. Thus, the findings obtained in vitro did not apply to the mechanism of PTU toxicity.

The evidence that PTU treatment caused the marked decrease of spleen weight with a concomitant loss of leukocyte numbers seems interesting. The spleen weight returned to normal, and the leukopenia induced by PTU was removed when its administration was discontinued. Neal and Halpert[16] proposed that the toxicity of thinosulfur-compounds such as PTU is most likely to be the result of the covalent binding of the electrophilic S-oxides or S-dioxides or cardene derivatives of these S-oxides or S-dioxides to tissue macromolecules; the decrease of rat spleen weight treated with PTU may be due to these metabolites.

This study suggests the participation of the spleen in the adverse effect of PTU. However, little is explained as to the function of the spleen's influence on granulopoiesis. At present, we propose that leukopenia induced by PTU treatment may be due to a decrease in the biosynthesis by the spleen of a colony-stimulating factor, which regulates granulopoiesis in the bone marrow[17]. Experiments are in progress to clarify the mechanism of induction of leukopenia by PTU.

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A herbicidal principle from *Caesulia axillaris* L., a weed of paddy fields

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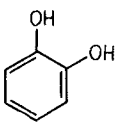
Summary. Screening of extracts from weeds of cultivated fields for their herbicidal activity was undertaken. The crude from alkaline aqueous extracts from leaves and stems of *Caesulia axillaris* (family Asteraceae), an aquatic weed from paddy fields, gave inhibitory effects in the seed germination test. Separation of the active principle by differential solubility method, and its identification by determination of m.p., b.p., UV- and mass-spectra established it as catechol (1,2-dihydroxybenzene). It was found to have selective herbicidal activity on *Ocimum* sp., *Ammannia* sp. and *Fimbrystylis* sp. against *Oryza sativa.*

Reports on plant products to be used as herbicidal[2], fungicidal[3,4] and insecticidal[5] agents are rapidly appearing in literature. Rizvi et al.[6] have reported that caffeine from seeds of *Coffea arabica* has herbicidal property and may be called a 'natural herbicide'. Hence, it was considered desirable to further screen plants for isolation of such active principles.

Experimental procedure and results. 1 kg dried shoots of *Caesulia axillaris* were crushed in 2 l of distilled water at room temperature (30±2 °C). The extract was filtered through cheese cloth and an equal volume of ethyl acetate was added to the filtrate. The ethyl acetate layer was separated with a separatory funnel to which 500 ml aqueous solution of 10% (w/v) NaOH was added. The mixture was again separated and the ethyl acetate layer was discarded. Concentrated HCl was then added to make the alkaline solution neutral. This was treated with ether or ethyl acetate, and the organic layer containing phenol, was preserved. The aqueous layer was discarded.

Identification of the active principle. The organic layer was evaporated to dryness at 30 °C in vacuo. The dry powder was dissolved in ethyl acetate and was subjected to TLC using acetic acid : HCl : Water (6 : 3 : 1) as solvent system and gave 5 spots. All the 5 spots were eluted separately and were bioassayed by the seed germination test. One of them was found to be most effective in inhibiting germination of the 3 test weeds (*Ammannia* sp., *Ocimum* sp., and *Fimbrystylis* sp.), but no such inhibition was noted on germination of seeds of *Oryza sativa.* However, it was interesting to note that the unknown compound promoted the growth of root hairs and caused branching in the primary root. Co-TLC with known phenolic compounds and the R_f resembled that of catechol. This was confirmed by its m.p. 105 °C, b.p. 240 °C, UV- and the mass-spectra. The compound was found to have mol.wt of 110 with structural formula as given in the figure.



Catechol (1,2-dihydroxybenzene)

Germination experiments. Experiments on germination of seeds of *O. sativa* and the test weeds were carried out both

Effect of different concentrations of the active principle extracted from *Caesulia axillaris* on germination of seeds of test weeds and of the test crop

Concentration of active fraction (mg/l)	Inhibition of germination (%)			
	Test crop	Test weeds		
	Oryza sativa	*Ocimum* sp.	*Ammannia* sp.	*Fimbrystylis* sp.
0 (control)	Zero	Zero	Zero	Zero
500	Zero	82.5	72.5	67.5
750	Zero	100.0	92.5	92.5
1000	Zero	100.0	100.0	100.0

with the chemical compound extracted from the wild plant, *Caesulia axillaris*, and the catechol obtained from a chemical firm. The concentrations used were 500, 750, and 1000 mg/l in distilled water. 100 seeds each of *O. sativa* and the test weeds were washed thoroughly with distilled water and were kept in petri-dishes (8.5 cm in diameter) on 1 layer of filter paper soaked with 5.0 ml solution of different concentrations. The petri dishes were kept in dark in an incubator at 32 °C for 36 h. Three replicates of each treatment were maintained. The untreated (control) seeds were provided with the same amount of distilled water. The seeds containing emerged radicles were counted for germination. It was found that a concentration of 500 mg/l of catechol inhibited germination of the test weeds by about 67%, while the other 2 concentrations (750 and 1000 mg/l) inhibited up to 100%; no inhibition, however, was noted in seeds of *O. sativa* at these concentrations (table). Similar results were obtained with the phenolic extract.

Discussion. Plant parts are known to exhibit biological activity on account of the presence of some active principles[7-10]. In the present investigation the leaves and stems of *Caesulia axillaris* exhibited more herbicidal activity than its roots. The active principle, identified as 1,2-dihydroxybenzene, is a well known bacteriostatic and bactericidal agent. Its selective herbicidal property has been established in the present investigation when it was found to be phytotoxic to *Ocimum* sp., *Ammannia* sp., and *Fimbrystylis* sp. but non-phytotoxic to *O. sativa* in the paddy fields. The present findings are significant from the point of view of exploitation of catechol as a herbicide against weeds of *O. sativa*.

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Fibrin and collagen deposition and fibroblasts proliferation in granuloma of murine leprosy. Comparison of two mouse strains with different immune reactions[1]

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Summary. Comparative immunofluorescence study with murine lepromas induced in C57BL/6NJcl (immunologically high responder) and CBA/N (low responder) mouse strains revealed that fibrin formation was associated with cell-mediated immune resistance against invasive bacilli. Histochemistry on paraffin sections further elucidated fibroblast proliferation and formation of collagen fibers following fibrin deposition only in murine lepromas with positive host reactions.

In murine leprosy, Poulter and Lefford[2] demonstrated that lymphocytic and monocytic infiltration against the bacilli is mediated by transferable cells but not by serum. The potential immunological reactivity which are genetically determined for each mouse strain induced murine lepromas which varied in their cellular composition. Kawaguchi[3] and Closs and Haugen[4] reported that a polar type of murine lepromas induced in C57BL/6 strain was shown to consist of phagocytic macrophages as well as non-phagocytizing monocytes, epithelioid cells, fibroblasts, and lymphocytes. Consequently, this type of murine lepromas with positive immune reaction was localized at the site of inoculation and occasionally showed spontaneous healing after ulceration. The other polar type of lesion without host reaction was shown to contain only macrophages ingesting bacilli but no lymphocytes or other reactive cells. The murine lepromas were continuously developed and finally showed dissemination of lepromatous lesions to the liver and spleen[5].

Activation of the coagulation system has been demonstrat-