

later in China (Tai¹). It has not so far been recorded from any other place in the Orient. *C. Puerariae* Syd. reported from the Philippines on *Pueraria Phaseoli* is a different species. Weimer and Luttrell assume that *Mycosphaerella Pueraricola* has been introduced into the United States along with kudzu seeds imported from Japan.

Microscopic studies of the diseased kudzu leaves collected in Bangalore, revealed the tufts of conidiophores arising from the pseudoparenchymatic stroma. They were amphigenous, but mostly hypophyllous, simple, olive-brown, 1-6 septate, 85-180 × 3.5-4.5 μ. Conidia were hyaline, obclavate to cylindrical, filiform at the apex, up to 15-septate, 85-170 × 3-3.5 μ. The conidia and the conidiophores were therefore slightly larger than the measurements given by Weimer and Luttrell for *M. Pueraricola* (conidiophores 20-84 × 4-4.5 μ, conidia 25.2-126 × 3.5-3 μ).

The present record of *Cercospora* on kudzu plants in Bangalore grown from imported seeds is of interest since no *Cercospora* species is known on kudzu or *Pueraria tuberosa* DC. the only indigenous species known in South India. Care should be exercised in preventing the spread of the disease if large-scale cultivation of kudzu is undertaken.

Bangalore, M. J. THIRUMALACHAR.
December 15, 1948.

1. Tai, F. L., *Bull. Chinese Bot. Soc.*, 1936, 2, 45-66.
2. Weimer, J. L. and Luttrell, E. S., *Phytopathology*, 1948, 38, 348-58.
3. Yamamoto, W., *Trans. Sapporo Nat. Hist. Soc.*, 1934, 13, 139-43.

PRODUCTION OF THYMOL FROM AJOWAN SEEDS

AJOWAN oil distilled from the seeds of an umbelliferous plant, the ptychotis ajowan (*Carum Copticum*), is an important source of thymol in India.

A general survey of the oil content of the ajowan seeds gathered from the villages of Punjab is made in this laboratory. Steam distillation of the coarsely ground seeds is best for the extraction of the oil.¹ Treatment of the coarsely ground seeds with solutions of different concentrations of alkalis or salts followed by steam distillation lowers the yield of the oil.

Iklas seeds give a maximum average yield of 4.2% of oil on the weight of the seeds.

Thymol in ajowan oil is estimated by its conversion into iodo-derivative and titrating the excess of iodine.² The oil from the seeds of Iklas and Sabazpur contain respectively 39.3% and 36.2% thymol on the weight of the oil. Method of Dodge³ presents difficulties due to the formation of stable emulsions.

EXTRACTION OF AJOWAN OIL

TABLE I

Method: Steam distillation. 100 gms. of coarsely ground seeds used in each distillation

Distillation	Locality of seeds	Yield of oil in gms.	Colour of the oil
1	Nagawali	2.85	Light yellow
2	"	2.99	"
3	Pindighels	3.63	Golden yellow
4	"	3.53	"
5	Domeli	3.97	Light brown
6	"	3.83	"
7	Sabazpur	4.18	Light yellow
8	"	4.13	"
9	Iklas	4.15	"
10	"	4.23	"

TABLE II

Method: Steam distillation. 100 gms. of coarsely ground Iklas seeds used in each case after treatment with alkali or salt

Distillation	Treatment	Yield of oil in gms.	Colour of the oil
1	Kept 8 hrs. with 500 c.c. 5% NaOH	0.5	Light brown
2	" " 1% NaOH	1.01	Brown
3	" " 2N NaCl	1.53	"
4	" " 5N KNO ₃	2.23	"

According to Chopra and Mukherjee⁴ the seeds from different parts of the country yielded varying proportions of oil ranging from 2.0 to 3.5%. Seeds obtained from the Kurnool-Guntakal district of Madras Presidency appeared to be the best obtainable in India. These seeds gave a high yield of oil, i.e., 3.5%. The seeds obtained from Northern India yielded only 2.07% of the oil, and the percentage of thymol in most of the Indian oils is not more than 33 to 37%.⁴ This publication is delayed due to the political changes at Lahore.

Technical Chem. Laboratory,
Forman Christian College, JAMES VERGHE E.
Lahore, K. C. GULATI.
November 25, 1948. M. L. JOSHI.

1. Inuganti, Bhate and Hassan, *Industries and Commerce, Nizam Govt. Publication, Bull.* 1924, 8, 2-3.
2. *Allen's Commercial Organic Analysis*, 4, 138.
3. Dodge, *Amer Perfumer*, 1939, 35, 4, 39.
4. Chopra and Mukherjee, *The Ind. Med. Gaz.*, 1932, 67, 361-62.