

Short Communication

Pakistan J. Sci. Ind. Res., Vol. 21, No. 1, February 1978

SEEDS OF PEGANUM HARMALA A Possible New Source of Edible Oil

SALIMUZZAMAN SIDDIQUI and (MISS) NIGHAT AFZA

*H.E.J. Postgraduate Institute of Chemistry, University
of Karachi, Karachi 32*

(Received January 12, 1978)

Careful sifting of literature on the isolation of alkaloids from the harmala seeds has shown that beginning with their examination by Goebel in 1843, all subsequent work in this field has been based on the extraction of the crushed whole seeds. Various authors have carried out the extraction of crushed material with alcohol or methanol, either directly or after extraction with petroleum ether to remove the fatty matter [1-4]. In certain cases the whole crushed seeds were extracted with acidulated water [5-7]. So far as the nonalkaloidal constituents are concerned the main product is the fatty oil, *variously* recorded as constituting about 10% of the weight of the seeds. Siddiqui also noted that the oil obtained in the procedure of isolating the alkaloids is coloured deep red and has to be extracted with 5% alcoholic HCl to remove the residual weaker base harmine from the oil complex.

In the course of studies on the germination metabolites of the harmala seeds, it has been discovered that the alkaloids are located wholly in the husk which constitutes 50% of the seeds on dry weight basis, and that the fatty oil obtained from the kernel through petroleum ether extraction is chromatographically free from alkaloids.

The exhaustive study of the light straw-coloured oil which is obtained in a yield of about 20% on the weight of the seed kernels (as against an average of 17% in cottonseed) has brought out the fact that it closely conforms in its composition to the cottonseed oil (cf. Table 1) and could well be used for various industrial purposes as well as an edible oil. Considering the fact that about 50% of the vegetable oil requirements of the country have to be covered by imports, it would appear imperative to exploit this

TABLE 1. COMPARATIVE CONSTANTS OF THE COTTONSEED AND *Peganum harmala* KERNEL OILS.

Physical and chemical constant	Cottonseed oil	<i>Peganum harmala</i> kernel oil
Specific gravity	0.917-0.918	0.9149
Refractive index	1.4745	1.470
Tintometer number	Yellow-2 Red-0.4	Yellow-2 Red-1.4
Acid value	0.6-0.9	3.0
Iodine value	103-111	118
Saponification value	194-196	175-5
Thiocyanogen value	..	79

new source of oil. This should be economically feasible because the plantation of *Peganum harmala* which grows wild could be carried out in nonarable lands without disturbing the agricultural economy of the cash crops of the country. It may also be added that the establishment of such an oil industry will stimulate researches in the alkaloids obtained from the husk in high percentage (ca. 7%) with the object of their large scale commercial utilization.

It is interesting to note that as a result of earlier work on germination metabolites it was noted that the hand picked sprouts did not contain any alkaloid or its basic degradation product.

References

1. Arsenio Fraile Ovejero, *Formacognosia* (Madrid) **6**, 103-62 (1942).
2. S. Siddiqui, *Pakistan J. Sci. Ind. Res.*, **5**, 207 (1962).
3. S. Siddiqui, R. Kemal, *Pakistan J. Sci. Ind. Res.*, **7**, 1 (1964).
4. A. Chatterjee, and M. Ganguly, *Phytochemistry*, **7** (2), 307-11 (1968).
5. N.I. Buntzelman, *Byull. Nauch. Issledovated Khim. Farm. Inst.*, 71-2 (1931).
6. V. Hazenfratz, *Ann. Chim.* **7**, (10), 151 (1927).
7. S. Elgazin, *Khim. Farm. Prom.*, 128-31 (1932).
8. Tayyaba Hassan, M. Sc. Thesis Institute of Chemistry, University of Karachi (1969-70).