

African Rue (*Peganum Harmala* L.) in the United States

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Since its introduction into the United States, *Peganum Harmala* L. has become designated as "African rue" and by a few other names (probably none of them used for the species in its native area.) Although it does not belong to the rue family, but occurs in northern Africa, it also grows in western Asia near the Mediterranean Sea, and in south-eastern Europe. The plant is perennial, glabrous, succulent, up to 0.75 m. tall and 1.2 m. broad; stems herbaceous, forked, corymbosely branched; leaves irregularly dissected, their lobes linear and acute; flowers relatively large, petals white, oblong-elliptical, somewhat shorter than the calyx; capsule 3-valved, loculicidal, erect, depressed at the tip; seeds angular, numerous. In Texas a native species of *Peganum*, *P. mexicanum* A. Gray, occurs in the valleys around Eagle Mountain and the Quitman Mountains, particularly in Eagle Flat and the Quitman Valley. The native species is woody at the base, prostrate, with its relatively small flowers and fruits borne on the under side, usually hidden by the foliage.

My first intimation that there was such a plant as *Peganum Harmala* came on receipt of specimens from the New Mexico Agricultural Experiment Station. This was prior to their publication of a bulletin reporting it in connection with cattle losses near Deming, southern New Mexico. My friend, Dr. W. L. Black, (with whom I had traveled in the investigation of forage poisonings in Texas) was then in charge of livestock investigations in New Mexico. He wished information on the differences between the introduced species and the one native in northern Mexico and western Texas.

I read the New Mexico publication with more interest because I had seen specimens of *Peganum Harmala*. I took no particular interest in the plant, however, until October 29, 1938, when I came across it growing on the western edge of the town of Pecos, Texas. I had lived at the Experiment Station near Pecos during the years 1920-1922, and had returned thither as opportunity offered, so was familiar with

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the vegetation of the region. It was reasonably certain that the plant was a recent arrival there, and a newcomer to Texas. After breakfast on October 29, 1938 (the plant was first discovered on a stroll before breakfast), we drove out on the highway leading to Balmorhea. We found it growing on the side of this highway two miles southwest from the point where U.S. Highway 80 crosses Main Street in Pecos. This would indicate a spread of a mile or more from the original infestation, whose exact location is unknown.

In June, 1928, the late W. T. Carter (then Chief, Division of Soil Survey, Texas Agricultural Experiment Station) and myself had visited the New Mexico Agricultural Experiment Station at Mesilla Park, in the Rio Grande Valley of southern New Mexico. Because of this early experience and because Dr. Black was no longer (1938) associated with the New Mexico Station, I informed Mr. C. P. Wilson (in charge of publications at the New Mexico Station) of the tremendous jump of *Peganum Harmala* from Deming to Pecos, some 250 airline miles, and asked for information concerning the status of the plant in his state. He replied that earlier in the year (1938) C.C.C. boys had been used to grub out all the plants growing in New Mexico, and urged us to campaign for a determined effort to eradicate similarly this new infestation at Pecos. This and further correspondence led us to plan a field trip to the original site of the introduction of *Peganum Harmala* into the United States.

I made the trip on September 3-9, 1939, with Mr. H. R. Reed of Sonora, Texas. The first night was spent at Pecos. The next day we traveled over the roads radiating from Pecos, and found *Peganum Harmala* on the Balmorhea highway nearly three miles further southwest, which is a rather limited extension. We found it also along U.S. Highway 285 at points a few miles both north and south of Pecos. The plant grew from the western edge of Pecos a quarter mile or so in toward the business area, ending where *Allenrolfea* and other halophytes marked an abrupt change in vegetation. The plant was most abundant at the area cleared for an airfield about two miles southwest of town.

Previously Dr. W. L. Black had given me the history of the introduction of *Peganum Harmala* into the United States. Near Deming, New Mexico, a man fond of growing unusual plants had obtained seed from Europe. The plant

grew well, and spread after cultivation had ceased.

In our correspondence, Mr. C. P. Wilson, though not connected with range investigations, had offered to accompany me to Deming. We arrived there on September 6, about noon. Early in the afternoon we drove back east three miles on U.S. Highway 80 to an abandoned field (now returned to native vegetation) lying south of the highway. There was no sign of human habitation, but Mr. Wilson knew where the buildings once were located—a quarter-mile or more southeast of the northwest corner of the field. At the site and radiating therefrom were plants of *Peganum Harmala*, showing medium growth, recovering after having been grubbed out deeply the preceding year. This convinced us that the plant could not be eradicated merely by grubbing it out. Mr. Wilson told us that it now had spread north and south across parallel highways three miles apart. We did not see normal growth of the plant in New Mexico, but we suspect that it may be better adapted for growing and extending its distribution around Pecos than around Deming.

Several plants of *Peganum Harmala* grew in 1940 on the grounds of the Veterinary Hospital at Texas Substation No. 14, near Sonora, from seed lost out of herbarium collections. We let these plants flower and fruit. They were accessible to livestock during most of the time of their growth, but neither cattle, sheep, nor goats ever tasted them. The plants grew about as well near Sonora as at Pecos. After we took herbarium specimens, the plants were grubbed out. At intervals thereafter, whenever green growth showed up, efforts were made to eradicate it. Some time the following year the last tiny piece of root was discovered and removed from the soil, so now there is no *Peganum Harmala* growing in Edwards County, Texas.

On two subsequent occasions we resurveyed the occurrence of *Peganum Harmala* in the vicinity of Pecos. The later of these was on May 5-7, 1946. On May 6 we made the following collections: (a) No. 52093, 7 miles west of Pecos (the plant was frequent to occasional on the shoulders of U.S. Highway 80 this far out from town); (b) No. 52113, 5½ miles southeast of town (where a few plants grew on the shoulders of the graded Grand Falls road, west of the place where this road drops down into the flat and saline

valley which is the outlet of Lake Toyah—*Peganum Harmala* does not grow in highly alkaline soils); (c) No. 52116, $14\frac{2}{3}$ miles northwest of Pecos (on the shoulder of U.S. Highway 285, near a culvert, where the largest of several plants had a spread of four feet or more). On this same highway southeast of Pecos the plant was seen the preceding day as far away as eight or ten miles; No. 52121 was collected along U.S. Highway 80 at a point 2 miles west of Barstow, the first record of its occurrence in Ward County. On the following day (May 7) I collected No. 52149 in Reeves County, 2.4 miles east of Balmorhea. This point is about twenty-seven miles southwest of where *Peganum* grows at the western edge of Pecos, and apparently represents the greatest extension of range of this species since its original infestation. Obviously the species is spreading in every direction from its starting point in Texas. While as yet there is no report of its poisoning livestock in Texas, nevertheless its continued growth and spread should be discouraged.

Notes on Texas Compositae — I

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In the introduction to the unabridged edition of his *Study of History* (1933), Toynbee comments on the invasion of the field of scientific investigation by the Industrial System: the working up of raw materials ("data") by many individual workers ("scientists") into finished products ("papers," or as so commonly designated, "the literature"), according to more or less standardized methods of mass production ("Research"). Toynbee leaves it an open question whether this is not after all the best manner in which scientific investigation should be conducted in the present stage of development of western science. Certainly the magnitude of the task makes a division of labor inescapable.

Yet the extent to which fragmentation is carried over into the printed output in systematic biology makes for considerable inefficiency, at least as viewed from the standpoint of ready and effective utilization. It is difficult to approve

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