The extracts were free of microorganisms and stable to autoclaving at a *p*H between 7 and 10.

Inhibition of *Micrococcus flavus* was shown by the standard plate technique for antibiotics. The extracts were further checked for bactericidal or bacteriostatic action against *Pseudomonas aeruginosa* and *Aerobacter aerogenes* by turbidity measurements.

Cellulose digestion, *in vitro*, was enhanced and the lag phase of washed rumen microorganisms was shortened when 0.1 ml of the extracts was added to 11 ml of the culture medium. Further studies are under way to determine the nature of the factor responsible for the inhibitory effect on contaminating microorganisms of the rumen.

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References and Notes

* Journal Series Paper No. 1459 approved by the director of the Missouri Agrciultural Experiment Station.
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13 May 1954.

Tarahumara Indian Piscicide: *Gilia macombii* Torrey

During a recent expedition among the Tarahumara Indians (*1*) in the Sierra Madre Occidentalis of northwestern Mexico for medical and ethnologic studies, I inquired of the Indians about the present-day use of fish poisons. Only a small number of these seminomadic, part-time cave-dwellers—those Indian families living near the Rio Conchos and other large rivers of the Sierra—still used piscicides. Among those still employed, I found *Gilia macombii* Torrey, a plant not previously reported to have been used as a fish poison or known to be pharmacologically active in fish or mammals.

The fish poisons previously reported from the Tarahumara Sierra by Lumholtz (*2*), Bennett and Zingg (*3*), and Clavigero (*4*) are summarized in Table 1.

I was told by Indian informants in the Sisoguichi and Norogachi areas of several fish poisons still in use. We were able to collect only the one called by the Tarahumara *nawé* and another called *matéshuwa*. In the area between Sisoguichi and Norogachi *matéshuwa* was in bloom in September 1953 in the lower land along streams. *Nawé* was found in the Wichaiochi area. Only the root was used as a piscicide. It is a fish poison of the genus *Tephrosia* (*3*).

Different informants in Sisoguichi, Wichaiochi, and Norogachi considered the purple-flowered plant they called *matéshuwa* to be the most potent fish poison in the region. The entire plant (stems, leaves, and flowers) except the root was used by crushing the freshly gathered plant between rocks in a dammed, slowly flowing part of the stream. The Indians claim that a few armloads of the plant are sufficient to stun the fish and to cause them to rise to the surface for several hundred yards downstream. The poisoned fish may be eaten without danger.

Table 1. Fish poisons previously recorded.

Plant	Part used	Reference
Agavé sp.	Leaves	(*2*)
Polygonum sp.		(*2*)
"Palo de la flecha"	Bark	(*2*)
Calcalia decomposita A. Gray	Entire plant	(*3*)
Casimiroa edulis Llav. and Lex	Entire plant	(*3*)
Casimiroa sapota Oerst	Entire plant	(*3*)
Tephrosia talpa Wats (Synonym: *Cracca talpa* Wats)	Root	(*3*)
Sebastiania bilocularis S. Wats	Sap	(*4*)

Lyman B. Smith, curator of the Division of Phanerograms of the Smithsonian Institution, has identified pressed specimens of *matéshuwa* as *Gilia macombii* Torrey. Species of *Gilia* have not previously been reported as piscicides of the Tarahumara or of any other ethnic group (*5*), nor have toxic substances been associated with this genus in the past.

Preliminary experiments, carried out with Charles L. Wisseman of the Army Medical Center, using goldfish (sp.) weighing 3 to 5 g, indicate that a filtered, cold aqueous extract made from powdered dried plant in a concentration of 1.0 mg/ml is sufficient to stun the fish in 10 min and to kill them in less than 50 min. The fish rise frequently to the surface to swallow air, lose their equilibrium and lie on their side, and become inactive except for quick jerking movements before dying. An extract made from only 0.2 mg/ml of the dried powdered plant has killed the goldfish in 2 to 2.5 hr. Plants dried at room temperature for 3 mo were used.

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