DISCUSSION

A CHINESE INSECTICIDAL PLANT, TRIPTERYGIUM WILFORDII, INTRODUCED INTO THE UNITED STATES

Tripterygium Wilfordii, Hook f., called lei kung teng,[1] "Thunder God vine," by the Chinese, is a perennial twining vine belonging to the family Celastraceae with foliage and manner of growth very much like that of our native North American bittersweet, *Celastrus scandens* L. The fruit of *Tripterygium,* however, differs from the bright orange and scarlet clusters which the bittersweet vine bears in profusion in autumn; it is dry, indehiscent, yellowish green or brownish in color, 1.5–2 cm long and 7–10 cm wide, with 3 wings, running lengthwise.

Tripterygium Wilfordii is cultivated rather widely in several Chinese provinces on the south side of the Yangtze River, especially in Chekiang Province. The Chinese market gardeners have for a long time made use of the powdered roots of this plant as an insecticide to kill insects which eat the leaves of vegetables such as cabbage, cucumbers, carrots, etc.

About ten years ago lei kung teng suddenly came into prominence in Chekiang Province because of a dispute regarding the damage to valuable, highly productive valley lands caused by the wash from the nearby hills incident to heavy rains following the harvest of the Tripterygium roots, an operation which leaves the soil loose and easily washed away.[2] The land owners in the fertile valleys asked that the culture of lei kung teng be forbidden, but this quickly provoked the active opposition of the vegetable growers who said they could not grow their crops without using the powdered roots of this plant to kill noxious insects. Entomologists and other experts were sent to investigate the matter, and, in consequence about a dozen important papers and nearly as many more brief notes[3] have been published by Chinese experts since 1931 on *Tripterygium Wilfordii* and its insecticidal use. Some of these reports give in detail proofs beyond question of the insecticidal value, as a stomach poison, of the lei kung teng powder.

[1] Written *lei kung t'êng* in the Wade system of romanization.

[2] Erosion damage so caused in central Chekiang Province is discussed in detail by Lü Chin-lo, cited below in footnote 3 (c).

[3] The more important papers are: (a) Ch'ên T'ung-su, in *Chekiang Reconstr. Monthly,* 5: 74–78, 1931; (b) Lin, Hsiung-hsiang, in *Jour. Agr. Assoc. China,* No. 100, 48–73, ills., 1932; (c) Lü Chin-lo, in *Entom. and Phytopath.,* 1: 256–258, 1933; (d) Ch'ên T'ung-su, in *Jour. Agr. Assoc. China,* No. 118: 67–74, ills., 1933; (e) Yen Chin-lan (Nien, C. L.), in *Jour. Agr. Assoc. China,* No. 125: 79–82, 1934; (f) Chou Ming-tsan, Huang, Shiu-lun and Hsü Yü-fên, in *Chedah Agr. Quart.,* 1: 3–56, ills., 1937; (g) Huang Shui-lun, in *Bull.* 5, Kwangsi Agric. Exp. Sta., 2 pp. 1939. All in Chinese except (g)

In the course of an investigation of Chinese economic plants, translations of these articles were made for the Division of Plant Exploration and Introduction by the Chinese translator, Mr. Michael J. Hagerty, working under the direct supervision of the senior author. Impressed by facts brought to light in these Chinese reports, a trained Chinese plantsman was sent in the autumn of 1935 to Chekiang Province, where this insecticidal plant is grown on a large scale. There he secured several thousand cuttings which arrived in Washington in good condition and grew very well at the U. S. Plant Introduction Garden of the Division of Plant Exploration and Introduction at Glenn Dale, Md.

Root powder of *Tripterygium Wilfordii* sent from China in the autumn of 1935 was given a tentative test in the Division of Control Investigations, Bureau of Entomology and Plant Quarantine, and was found to have little or no value as a contact insecticide. Another small importation of root-powder was made from China, and with it a second test was made by the Division of Control Investigations in the spring of 1936, this time using the root powder as a contact and a stomach poison against the larvae of the silkworm, *Bombyx mori* (L.); eastern tent caterpillar, *Malacosoma americana* (F.); southern armyworm, *Prodenia eridania* (Cram.); and Colorado potato beetle, *Leptinotarsa decemlineata* (Say.). These insects were not affected by contact, but the silkworm, eastern tent caterpillar and the potato beetle larvae were deterred from feeding on leaves dusted with the powdered plant material. The silkworm and potato beetle larvae that fed on the dusted leaves were affected and died after having taken a sufficient dose. The southern armyworm was not deterred from feeding on dusted leaves and was not affected by the dust. This last batch of powders tested was, however, at least six months old when used, and the Chinese insist that the insecticidal value of this powder declines steadily and is entirely lost after one year's storage; therefore it is probable that the powder tested in April, 1936, had already lost much of its toxic power.

In view of the indecisive nature of these preliminary tests of more or less deteriorated powders, it was decided to make further tests as soon as freshly prepared powder could be obtained from the plants growing at the Plant Introduction Garden at Glenn Dale, Maryland. Such root powder was secured in September and October, 1939, from vigorous plants that had made four years' growth.

The material was very toxic to first instar larvae of the diamondback moth, *Plutella maculipennis* (Curt.) and the imported cabbage worm, *Pieris rapae* L. The material caused relatively low mortalities and

in some instances practically none on first instar larvae of the southern armyworm, *Prodenia eridania* (Cram.), second and larger instars of the melonworm, *Diaphania hyalinata* L., and large larvae of the southern beet webworm, *Pachyzancla bipunctalis* (F.). Alcoholic extracts gave slightly better results. The material was very repellent to small larvae which attack Cruciferae but was much less effective than derris on larger ones.

When tested against the larvae of the codling moth, *Carpocapsa pomonella* (L.), by the apple plug method the root powder gave about 60 per cent. clean fruit when used at the rate of two pounds per fifty gallons of solution. An alcoholic extract of the fresh root when used at the rate of two pounds extractives per fifty gallons solution gave 90 per cent. clean fruit. The results against the codling moth larvae have been deemed of sufficient interest to warrant a detailed chemical study of the plant extractive. Such a study is now under way, and the results of the toxicity of the various fractions of the extractive to the insect will be published soon elsewhere.

WALTER T. SWINGLE
BUREAU OF PLANT INDUSTRY
H. L. HALLER
E. H. SIEGLER
M. C. SWINGLE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

PROPOSED NAMES FOR THE FOLLICLE-STIMULATING AND INTERSTITIAL CELL-STIMULATING HORMONES OF THE ANTERIOR LOBE OF THE PITUITARY BODY

DESPITE the widespread use of the cumbrous terms, follicle-stimulating hormone and interstitial cell-stimulating hormone, no investigator has proposed simple etymologically justified names as badly needed substitutes. We should like to propose names which we hope either will be accepted by other investigators or will lead to the coinage of names which will receive general approval.

As a common suffix of both hormones, the term "kentrin" (from κεντρίζω, to goad, stimulate) seems suitable. An apt prefix for the follicle-stimulating hormone is furnished by the word θύλακος, bag, sack, —a word which Aristotle used to describe the sack in which the eggs of the tunny are enveloped. Therefore, "thylakentrin" is suggested as the name of the follicle-stimulating hormone. This hormone also stimulates or maintains the germinal epithelium of the testis. The name "thylakentrin" also suggests an action on the male gonad since θυλάκη is the Greek noun for scrotum.

"Metakentrin" (μετά, among, between, and κεντρίζω to goad, stimulate) appears to be a suitable name for the interstitial cell-stimulating hormone which has been isolated as a pure substance.[1] This name could refer to stimulation or maintenance of the interstitial cells of either the ovary or the testis.

HARRISON C. COFFIN
UNION COLLEGE
H. B. VAN DYKE
SQUIBB INSTITUTE FOR MEDICAL RESEARCH

THE ENCYCLOPEDIA OF CHEMICAL REACTIONS

A DISCUSSION of this proposed work of reference was printed in SCIENCE for June 15, 1934 (Vol. 79, p. 541). As a result of that article, together with other news reports of a like nature, many chemists volunteered their services, to assist in abstracting chemical reactions for the Encyclopedia.

Up to the present there are twenty-three abstractors, who are either actively engaged with abstracting or have contributed a considerable volume of reactions to the E. C. R. In addition to these, twenty-five other chemists have signified a willingness to assist in the work as soon as a publisher has been secured and the prospects have become more promising for bringing the work into print. This has now been realized. The Chemical Publishing Company, Inc., of New York City, have agreed to sponsor the publication of the E. C. R. and authorizes me to say that any one wishing to join our list of abstractors, will for a small contribution of his time, receive permanent recognition on the Board of Editors, besides enjoying the satisfaction of having helped in compiling a much needed work. The E. C. R. has been called "an indispensable reference work."

The abstracting of eighteen chemical journals is complete to about 1936. The abstracting of twelve others has been begun. Most of the journals in the English, Swedish and Czech languages have been covered, but abstracting assignments can still be secured in the remaining ones and especially in the French, German and Japanese journals. Over 6,000 reactions have been typed and are now ready for the press. It is to be hoped that many other chemists will feel inclined to give some assistance to this "monumental work."

C. A. JACOBSON
WEST VIRGINIA UNIVERSITY, MORGANTOWN

ANIMAL BEHAVIOR DURING AIR-RAIDS

RECENT months have given observers in Britain an opportunity of obtaining some interesting information relating to the behavior of animals under conditions of modern warfare. A survey of such information as has so far been published would seem to indicate that

[1] T. Shedlovsky, A. Rothen, R. O. Greep, H. B. van Dyke and B. F. Chow, SCIENCE, 92: 178, 1940.